NATIONAL CAR BUILDER

VOLUME XVI.
NUMBER 9.

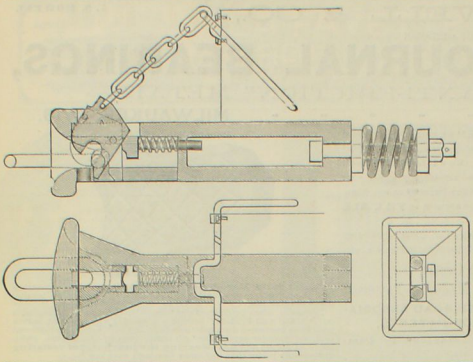
DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

$1.00 PER ANNUM
SINGLE NUMBERS TEN CENTS

NEW YORK:
Morse Building, 140 Nassau St.

SEPTEMBER, 1885.
ENTERED AT THE POST OFFICE AT NEW YORK N. Y., AS MAIL MATTER OF THE SECOND CLASS.

CHICAGO:
187 Dearborn Street.



THE CURTIS & WOOD
AUTOMATIC COUPLER COMPANY,

140 S. FOURTH STREET, PHILADELPHIA, PA.

The most complete, simple, durable and effective Automatic Freight Car Coupler. It is in actual and satisfactory use on some of the principal railroads. Automatic and certain, it insures absolute safety in coupling and uncoupling, and makes it unnecessary for trainmen to go between cars. It costs but little more than the ordinary link-and-pin coupling. It will couple to any draw-head, and can be adjusted to any draft rigging, or will take the place of any draw-bar now in use. We will equip cars for trial by any railroad desirous of testing the coupler on its merits. For full information, address

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WILLIAM H. CRESSON, Secretary.

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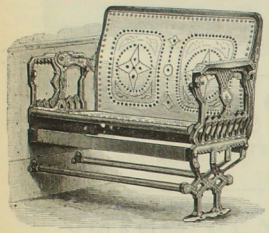

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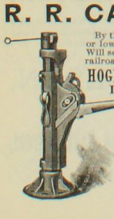

By this jack cars can be raised or lowered at any desired speed. Will send on 30 days' trial to any railroad.

HOGELAND & ANDERSON
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C. I., St. L. & C. Ry. Co.,
Indianapolis, Sept. 2, '84.

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Make a specialty of introducing MERITORIOUS inventions DIRECT to Railway Companies. Organizing Stock Cos. for the Mfg. of Ry. Appliances. "Bonds and other securities negotiated."

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CLAIM FOR "AJAX METAL"

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This Coupler is of the **"Vertical Hook Type,"** and has no springs. Its means of Locking is Gravity.

Guaranteed to couple on the sharpest curves to cars of different heights and styles.

It requires no fitting—ready from the molds to apply to cars. Draw-bar weighs from 80 to 120 pounds in malleable iron, and from 150 to 180 pounds in cast iron. It is Automatic in locking and unlocking, and is always ready for use. Cheap, safe and reliable. Address

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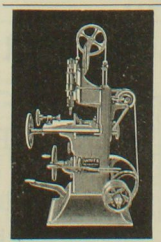

End View of No. 1, set up as a Mortiser.

Universal Wood Worker.

PATENTED APRIL 3, 1883.
THREE MORE PATENTS APPLIED FOR.

The simplest and best Router or Mortising Machine, Boring Machine, Straight Sticker or Variety Moulder, Engraving and Rosette Machine and Window Pulley Mortiser ever invented.

The No. 3 is the most useful Machine ever invented for

CAR-BUILDERS' USE.

Don't fail to send for illustrated catalogue and full particulars. Every Machine warranted and sample work sent to any address in the United States, express on samples paid by me.

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Atwood Safety Nut Co.,

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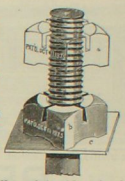

J. W. LARABEE,
Treasurer.

a. ATWOOD NUT on bolt without bearing on base slots open.
b. ATWOOD NUT turned to bearing c partially closing the slots and grasping the bolt.

RICHARD DUDGEON,

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Maker and Patentee of IMPROVED

Hydraulic Jacks, Punches
ROLLER-TUBE EXPANDERS,
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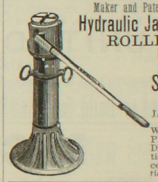

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Railroad Valve Oil.

Contracts made for specified quantities, deliverable, as required, at any depot in the United States or Canada.

Samples for trial, etc., will be cheerfully furnished on application to

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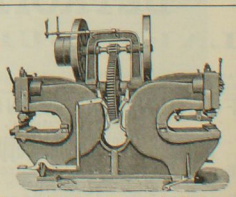

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We make over 100 sizes of Punches and Shears, Double and Single, varying from 500 to 30,000 pounds in weight, and adapted forevery variety of work. The Double machines are equal to two Single ones, as each side is worked independently. Also

ADJUSTABLE HELVE CUSHIONED HAMMERS

Of all sizes, Unequaled for Efficiency and Durability

THE LONG & ALLSTATTER CO.
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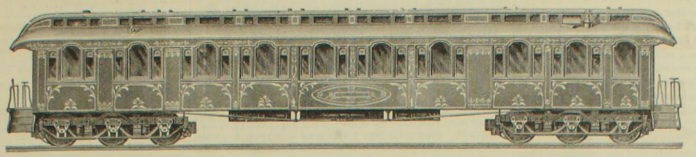
Index to Advertisements in the National Car-Builder.

THE NATIONAL CAR-BUILDER.



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Miscellaneous Items.

THE Master Car-Painters' Association will hold its sixteenth annual convention at Toronto, Can., beginning on Wednesday, Sept. 2.

THE C., B. & Q. road is said to be negotiating with the American Brake Co. and the Rote Brake Co. with the view of equipping a certain number of the cars of that road with the brakes of these companies, so as to be able to judge of their relative merits.

TWO Pullman sleeping cars with side doors have been introduced on the Midland Railway, of England. They are shorter than those of the ordinary type, and have no end doors or platforms. A little further modification and the Pullman features would disappear altogether.

THE Chicago & Northwestern Railway Company do not use the Master Car-Builders' standard car brass. They use a brass of their own design which weighs 14½ pounds when new and requires no wedge. The officers of this road claim that they have fewer hot boxes than any road in the country. A hot box on a passenger train is practically unknown on the road.

THE last monthly report received from the Fitchburg R.R. shows 95 locomotives in service, each making an average monthly mileage of 1,957 miles. On the Fitchburg division and branches, 40.3 miles are run to the ton of coal, and on the Vermont & Massachusetts division, which is heavy to operate, 30.6 miles are run to the ton of coal, 2,240 pounds being reckoned a ton.

THE Laconia (N. H.) Car Co. have built three first-class combination passenger and baggage cars for the Boston, Revere Beach & Lynn road. They are 52 feet long by 9 feet wide over sills. The inside finish of the passenger compartment is in mahogany, with bird's-eye maple veneer ceilings, the seats are the Hale & Kilburn rattan tilting pattern, and the lighting is by four double hurricane lamps made by Post & Co. The cars run on iron trucks with 30-inch steel wheels. Weight of car bodies, 25,000 lbs. each; trucks, 19,000 lbs.; total, 44,000 lbs.

TRAVELERS on the fast train between New York and Chicago over the New York Central route, say that the sleeping-car accommodations are better than they were under the old Wagner Car Co.'s management. It is said that the New York Central Sleeping Car Co., which replaced the Wagner Co., is quietly working to secure control of, or consolidate its lines with those of the Woodruff Co. The purchase by the former company of the right to provide the sleeping-car service on the Bee Line system, is said to have been a preliminary step in that direction.

MR. GEORGE J. JOHNSON, of La Crosse, Wis., an old conductor on the Chicago & Northwestern road, has invented a draw-gear attachment for railroad cars that is very well spoken of wherever it has been used. It provides for connecting the draw-bar by cross-pieces to the sills, for the purpose of preventing the draw-bar from being pulled out. Spiral springs are used to absorb violent shocks, and a combination is formed that is likely to prevent the troublesome and dangerous delays caused by the pulling out of draw-bars. The invention can be applied to any form of car.

THE Northern Pacific R. R. Co. have contracted to send through from Tacoma, Wash. Ter., to St. Paul, Minn., 2,000 tons of tea by special trains equipped with air brakes. These are the first tea shipments of the season, and the tea being brought from China by a vessel chartered by the road, and if the enterprise proves to be a paying one, it is the intention to develop the trade by this new route. The first train was run through to New York in 8 days and 4 hours, the whole distance being 3,378 miles. Some tea trains by way of Omaha on the Union Pacific and Chicago & Northwestern, got through from San Francisco to Chicago in less than five days, making better time than the ordinary passenger trains. Many railroad men think that in a few years the greater part of the tea for European consumption will be brought from China in this way.

FOR several years the government of India has been purchasing iron cars for freight business on Indian railways. Cars of this material are said to give entire satisfaction in service. Contracts were recently closed for the construction of sixty iron box cars and ten flat cars of the same material. All these cars are to be 25 feet long, and will be built in the American style, with center-bearing trucks and center coupling. The frames will be made of channel bar steel, and the transoms of the trucks will be steel. The floor, sides and roof of the cars are made of sheet iron riveted to angle irons. The published details are rather meager, but the cars do not strike us as being strong or as likely to be durable in rough service. The trucks are of iron, but in design they resemble the pedestal freight cars used in ancient times by the Boston & Albany and other Eastern roads.

MR. P. J. COCHRANE, Master of Machinery of the South Carolina Railway, has in his possession a piece of the first strap rail put down on the road he is connected with. That road has a claim to high distinction among American railroads, for the company were the first in the world to decide that their line should be operated by locomotives. When the directors of the Liverpool & Manchester Railway, the first line in England built for general traffic, were disputing among themselves about what form of traction they should use, the majority favoring rope traction and stationary engines, the directory of the South Carolina Railway, then under construction, decided to operate by locomotive engines, and gave their president permission to have an engine built. Many relics of this pioneer road were preserved for years, but most of them were destroyed or lost during the chaos and disorder caused by the war.

THE Illinois Central Railroad Company have got 12 Rogers locomotives in service that have been running over 30 years, and they still have the original boilers in use. Most of these engines are light, weighing about 25 tons, and have cylinders 15 × 22 inches and wheels 5 feet diameter. The engines are now getting too light for the work of the road and they will probably be cut up within a very few years, and the company can well afford to put the engines aside, for few locomotives have earned an equal amount of money. The oldest engine still running on the road is a Rogers make, which has been in service 33 years. Nearly thirty years ago this engine was run for some time by Mr. Morris Sellers, the well-known railroad supply dealer, and at that early day the engine was regarded as a wonder among locomotives, owing to the astonishing weight of trains she could pull.

THE Mann's Boudoir Car Co. have ordered the construction of four cars for the South Australian railways. They are built in sections for shipment, and will be the most elaborate and complete of any that have yet been turned out by this company. The order was given after a thorough investigation by a commission appointed by the South Australian Government Railway Administration, to determine the best style of sleeping car that could be obtained. The commission visited this country last year, and also went to Europe, where the Mann cars are extensively used. There are now 43 of them in regular service in the United States and Canada, and the company announce that they have recently organized a service on the Boston & Lowell road, and have extended their line between Chicago and Detroit to London, Canada, over the Great Western division of the Grand Trunk.

THE ordinary passenger locomotive on New England railroads averages an expenditure of between 60 and 70 pounds of coal per mile, at a cost of not far from 15 cents, while an expense of one half cent per mile for oil and tallow is considered a good showing. A run of 30 miles per ton of coal, and of 100 miles per gallon of oil, is not an unusual figure on Western roads. The cost of fuel is often about one-third the total cost per mile, that of oil about two or three per cent. of the total. Two or three times as much oil is used under a passenger car as under a freight car. The cost of repairs is enormously variable. It has been found in some cases of good practice, that a pound of bearing and a pound of journal are worn away by, respectively, 25,000 and 75,000 miles of travel. But the cost of this form of depreciation alone is enormously greater than the mere cost of material per pound. Using a black oil, the cost of wear has been found five times that of the lubricant and twice that of the power.

THE locomotive that was built by the Baldwin Locomotive Works some years ago for the purpose of making specially high speed on the Bound Brook route has come to a humiliating end. The engine had single-coupled driving wheels, 78 inches in diameter, driven by cylinders 18 × 24 inches, a steel boiler 52 inches in diameter supplying steam. The hind part of the engine was carried by a single pair of wheels, and a device was provided for throwing part of the weight that usually rested on these wheels on to the drivers. Although there seemed no limit to the speed this engine appeared capable of attaining with a light load, it was not regarded as a success for the heavy trains that have to be pulled between New York and Philadelphia, and was shortly afterward sold to the Eames Vacuum Brake Company and taken to Europe. After various vicissitudes this engine, which was during her latter days called the Lovett Eames, was sold in England recently for $900, and was broken up for scrap.

TWO new parlor sleeping cars have recently been put on the Connecticut River road. Each car has 20 revolving chairs. The berths and bedding by day are placed in perpendicular cabinets, that are folded back against the sides of the car between the windows, giving the effect of elaborate finish. At night the chairs are taken apart and folded down near the floor, and are not used at all in arranging the berths, the same upholstery both by day and night, as is the case in sleeping cars. The lower berths are not as high as the lower berths in sleeping cars, because the height is not determined by the height of the seat, and the upper berths are also lower and easier to get into. Each berth in each of the ten sections has light from a window and is furnished with bevel-edged mirrors, and the beds are hair mattresses upon steel springs. Each car has a large wash-room, smoking room, closets and buffet, and the ventilation is as near perfect as it can be. Each section is furnished with a child's seat, which lets down from the side of the car. The cars are finished in mahogany inside and out and are very handsome. The overhead nterior is beautifully decorated.

MR. ROBERT F. FAIRLIE, the inventor of the locomotive which bears his name, died in London, July 31, aged 55. In December last he went to Venezuela to construct and equip a complete railway system for that country, but caught the jungle fever while surveying some pestilential marshes, and was compelled to return to England, but never fully recovered. His well-known "double bogie" locomotive was originally designed for doubling the capacity of the famous Festiniog narrow-gauge railway without doubling the track. Its peculiar feature consisted in attaching the driving-wheels and cylinders to a truck frame which turned on a center-pin like an ordinary truck, independently of the boiler, the steam and exhaust pipes having flexible joints, and the driving-wheels being adjustable to the curvatures of the track. These engines have been extensively used in various parts of the world for the class of work for which they were intended, and in this country were very much improved by Mr. Wm. Mason, of Taunton, Mass. Their most conspicuous success was in Russia, on the line between St. Petersburg and Moscow, and for which the Czar ordered a special gold medal to be struck in honor of the inventor.

THE Scotch papers have lately devoted considerable space to descriptions of two sleeping cars built recently at Pullman, Ill., for the Highland Railway, and now running between Perth and Inverness. This road passes through some of the wildest mountain scenery in Scotland, and is a favorite route of travel for Southern tourists and sportsmen. The new sleepers are 36 feet 3 inches long, weigh 15 tons and accomodate 16 passengers. They are constructed on the separate compartment system, so dear to British caste prejudices. There are four separate compartments in each car, access to which is obtained from a passage down the center. Lavatories are placed between each compartment. The cars are handsomely fitted up with mahogany inlaid with maple and ash, the upholstering being in claret frieze plush, with curtains and carpets to match, and present a very rich and artistic appearance. Each berth is fitted up with electric bells, and special attention has been paid to ventilation. A free passage of air is obtained by means of dust and air deflectors, which are a novelty in Scotland, where ventilation is usually secured by opening the window when the weather is warm enough to admit of fresh air being passed into an unheated railroad car.

Chesapeake & Ohio Railway Co.'s System of Keeping Car Records.

While at the Master Car-Builders' Convention, in June, we were fortunate enough to make the acquaintance of Mr. G. W. Ettenger, chief draftsman of the Chesapeake & Ohio Railway, who promised to furnish us with particulars of their system of keeping records of passenger and freight car equipment. The following letter, with the accompanying forms, etc., gives eloquent testimony as to how the promise was kept:

RICHMOND, Va., July, 1885.

To the Editor of the National Car-Builder:

As I promised you to do when at Old Point several weeks ago, I send you a description of the system we have in use in our Motive Power Department for keeping a correct record of our freight and passenger equipment, and, in order that it may be perfectly understood, we will take a supposed case and follow it through.

Blue prints of the same style as Nos. 1,470 and 1,471 (detail drawings), with a copy of the specifications of the kind of car wanted, are placed in the hands of car-builders, and contracts made by the general officers of the company. The time and point of delivery having been agreed upon, the Motive Power Department takes the matter in charge, and a resident inspector is sent from one of the company's shops, to remain on the ground during the progress of the work. As fast as the cars are completed and found satisfactory, they are receipted for and sent into service, and daily reports are made by the inspector through the mails to the office of the Superintendent of Motive Power, sending in a Form, 439 (which are furnished him in pads of 50 each), filled out in ink with the dimensions of each car received, and the name of the inspector signed in full, he being instructed to measure each individual car before it leaves the works, thus forming an additional check against any inaccuracy in the workmanship.

Upon the receipt of these forms at the office of the Superintendent of Motive Power, they are copied into the Car Record Books (a leaf from one of which I send herewith), which gives a space for each individual car, and which will show at any time the dimensions and construction of the principal parts of the said car. This, upon any road owning and operating a number of cars of diversified sizes and styles, and which were built at dates widely apart, will be found a source of great convenience both for the Transportation and Motive Power Departments.

The car, after having been in service a short time, is wrecked, and a foot note in red ink is its obituary. This gives at all times the disposition made of the car, and where the proper papers can be found from which the authority to so record it was derived.

In a short time, a fresh order for cars is given, and the clerk in charge of the car record books is called upon for the numbers of the cars that are vacant in the different classes, and our old friend, 1381, is among the others that are resurrected. The same report as before (Form 439) and column two in the record books is called into service.

After some years of service the car is damaged and sent to one of the company's shops for repairs, and is gone over. Since the car was built, in the usual order of things new standards have been adopted, and the car is changed to suit the new practice, and a report of changes on "Form 440" is forwarded by the Master Car-Builder to the office of Superintendent of Motive Power, and is recorded by the clerk as a foot note, the circular marked "A" having been used to get Form 440 into service.

For the convenience and information of the authorities of roads using our cars, copies of blue print No. 1,472 were sent to the mechanical heads of each of our connecting lines and posted at prominent points in their shops, and each inspecting station on our own lines was also furnished with a copy.

Cars Nos. 980 and 1,381 were loaded at the seaboard for Chicago, and in transit met with an accident on a foreign road. The proper authorities elect to rebuild them, and require certain parts for that purpose. The cars were built at different times and are entirely different in their parts, but an order from the proper official, giving the number of each car and the number and name of the parts wanted, will enable the proper memorandum of the correct pieces to be made by the record clerk without delay. For example:

Mr. .... Supt. Motive Power,
Richmond, Va.

Please furnish ...., M. C. B., at Columbus, Ohio, for repairs of C. & O. Box-car No. 980:

2 Oil Boxes, with lids (no Brasses or Wedges).
5 Brake Heads and Shoes.
2 Brake Pawls and Ratchets.
1 Drawhead.

And for repairs of C. & O. Box-car No. 1,381:

4 Oil Boxes and lids (with Brasses and Wedges).
8 Brake Shoes and Heads.
2 Drawheads.
1 Set Irons for Side Door.

And charge same to account of

......................., Pur. Agt.

The order to the Storekeeper at Huntington Shops would be as follows:

Mr. ...., Storekeeper,
Huntington, W. Va.

Please ship to... ...., M. C. B.,........... Ry., Columbus, Ohio:

2 Oil Boxes C 266.
2 Oil-box Lids C 263.
5 Brake Heads C 297.
5 Brake Eccentrics C 298.
5 Brake Shoes C 299.
5 Brake Beam protectors C 300.
2 Brake Pawls C 182.
2 Brake Plates C 430.
2 Brake Ratchets C 429.
1 Drawhead C 255.
4 Oil Boxes C 237.
4 Oil-box Lids C 238.
8 Brake Shoes C 334.
8 Brake Heads C 333.
4 Wedges C 239.
4 Brasses E 10.
1 Set Castings, Wagner Side Door C 446, 447, 448, 449, 450, 451, 452, 453, 454.

2 Standard Drawheads. { C. M. I. Wks. C. & O. System. Annealed.

And send bill of same to office of Chief Clerk.

....................., Supt. Motive Power.

Our car resumes its journey and reaches its destination, where it is destroyed by fire and paid for, the bill for the same passing through the hands of the record clerk, entered by him under special head and checked again by him when paid, the original letter from the Chicago people authorizing bill to be made being filed as record in car record "General Information Book."

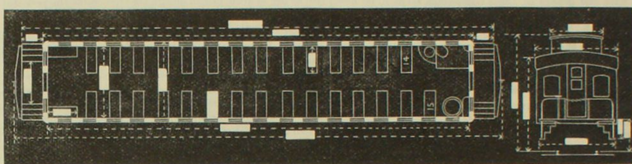
The company decides to build a few cars at their own shops, and No. 1,381 is given by record clerk to M. C. B. as a number for one of them. Form 439 is sent in as before, and the entry made in column three, which is the correct present standing of the car.

In the present case, the road owned and operated a large number of old cars, of which no record as to the styles of construction or sizes of parts had ever been kept, the cars having been furnished by different builders from their own standards. Blue print No. 1,472* was sent to each of the shops, and as fast as the cars came through they were measured and a Form, 439, filled out for each and forwarded to the office in accordance with circulars C 1, 2 and 3, which were issued in the order given.

As soon after the first of each month as the work can be got into shape, the record clerk makes out a statement (B) which shows exactly the number of cars owned by the company, and also shows at a glance what became of the cars that are recorded vacant. A copy of this, together with a supplementary form, is furnished to each of the proper officials of the road monthly.

For the record of the engine and passenger car equipment, forms of the same style are used, and in connection with the same the small blue prints come into service as dimension sheets, one of these being filled up with the principal dimensions of each coach or engine, and then bound into books and copies of the same put into the hands of the proper officials.

These prints in blank are of great service in calling for dimensions of any special work that it would not be convenient to send a draftsman to measure. For instance, if we were asked if a certain special foreign coach would pass safely over the road, we would send a print to the parties for the width and height to be put on it in the blank spaces. This would enable us to answer the question, and also form a record for answering future inquiries from same parties. This is but one of a number of instances in which any man that could use a rule or a line could furnish information wanted without being qualified to make sketches.



Form of Passenger Car Dimension Print.

This System of Car Records was put into service more than a year ago, and has worked like clock-work from the first day of its use, and from an almost chaotic state of affairs we are able at a moment's notice to describe the dimensions, condition, construction and age of any member of an equipment list which is perhaps as diversified as they generally become.

In binding the record books, the sample sheet shows the size used. This gives six cars to the page, and by arranging the different classes of cars by themselves, box, stock, gondola, etc., forms a ready means of reaching any car number.

G. W. ETTENGER.

C—1.

CHESAPEAKE & OHIO RAILWAY CO.,
OFFICE OF THE M. C. B.,
RICHMOND, ... Shops, ..., 188 .

Notice to Foremen.

On and after this date, all cars of the Chesapeake & Ohio and E., L. & B. S. and Kentucky Central railways, passing through these shops for repairs, are to be measured and reported in accordance with Form No. 439, blanks for which will be furnished you by the shop clerk. These reports must be handed into the office at the close of each day's work, signed with your name in full. You will post up the explanatory drawings, No. 52, and familiarize the men and yourselves with the proper numbers for the different kinds of trucks, draw-bars and brakes in use on the road's cars.

Approved. Signed

....
Supt. Motive Power. M. C. B.

Note.—The cars are to be measured after being repaired, and when they have two kinds of trucks or draw-bars it must be stated on the Form, giving both numbers. As soon as a car is measured, stencil it on the end sills with the shop stencil. These stencils must be used in every case. If you see the stencil on the end sill of a car, you will know that car has been measured and will not measure it the second time. Give the pattern number of the draw-head and brake-shoe and head castings, and if more than one kind is used, give both numbers. Fill up the Form carefully, taking care that the figures are perfectly legible. To learn the proper pattern numbers, see the sample castings painted black with white numbers at casting platform.

C—2.

CHESAPEAKE & OHIO RAILWAY,
OFFICE SUPT. M. POWER,
RICHMOND, VA.,..............188 .

DEAR SIR: In making the measurements called for on Form 439, the numbers wanted are:

		From				
Chesapeake & Ohio—	Box............	1	to	982	inclusive.	
" " "	Stock..........	3,000	"	3,192	"	
" " "	Gondolas.......	3,500	"	3,859	"	
" " "	Flats..........	4,300	"	4,529	"	
" " "	10-ton hoppers..	5,000	"	6,008	"	
" " "	5 " " ..	7,000	"	7,280	"	
" " "	8 " " ..	7,300	"	7,688	"	
" " "	Caboose........	8,000	"	8,457	"	
" " "	Fast-freight....	8,500	"	8,542	"	
" " "	Coke...........	9,000	"	9,124	"	
" " "	H. B. gondolas..	9,500	"	10,251	"	
E., L. & B. S.—	Box............	2	"	500	"	*
" " "	Flat...........	1	"	139	"	†
" " "	Stock..........	1,000	"	1,080	"	
" " "	H. B. gondolas..	1,500	"	1,561	"	
Kentucky Central—	Flats..........	1	"	199	"	
" "	Gondolas.......	1	"	199	"	
" "	Box............	200	"	700	"	
" "	Stock..........	701	"	800	"	

....
Supt. M. Power.

* Even. † Odd.

* Blue print No. 1,472 contains six outline tracings of brake-rods and levers for as many different cars; also seven styles of freight car trucks, seven kinds of draw-bars, and various patterns of brake-heads and shoes; all of which are numbered for convenient reference.

C. 3.

Subject (Reporting measurement of cars, Form 439).

CHESAPEAKE & OHIO RAILWAY CO.,
....DIV.

DEAR SIR: You will note that in measuring and reporting cars in accordance with Form 439, the following points are to be observed:

For box, fast freight, caboose and stock cars, dimension No. 10, or "height inside of box," is to be the height in the clear, or distance between floor and lowest point of the roof-carlines, and dimension No. 11, or "height above rails," is to be the distance from the top of rails to top of running boards, and for No. 14, or "style of roof," say "standard double board" "circular tin," or "square tin." Under the head of "remarks," note style and position of ladders and any peculiarities of construction worthy of record. For plain, hopper and drop-bottom gondolas, dimension No. 10, is to be the distance from top of the floor to top of the side, and No. 11 is to be the distance from the top of the rails to the top of the sides. For 4 and 8 wheel hoppers, dimension No. 10 is to be the distance from doors to top of sides, and No. 11 the distance from top of rails to top of sides. For flat cars No. 11 is to be the distance from top of rails to top of floor.

....
Supt. M. Power.

Specimen Form herewith.

Circular A.

Subject (Reporting changes in freight car construction).

OFFICE OF THE SUPT. MOTIVE POWER,
RICHMOND, Va., July 1, 1885.

DEAR SIR: On and after this date, when any changes are made from the original construction of the Ches. and Ohio, E. L. and B. S., and Kentucky Central freight cars repaired in your shops, they are to be reported in full on Form 440. The changes will be specified by number, using the numbers as indicated on Drawing 52. The Form must be filled up carefully and the signature written in full, the initials not to be used in any case.

Forward these to this office with the Corresponding No. 416.

....
Supt. M. Power.

Monthly Statement of the Freight Car Equipment on the Chesapeake & Ohio Railway, and the Elizabethtown, Lexington & Big Sandy and the Kentucky Central Railroads for the month ending ———, ——.

OFFICE OF THE SUPT. MOTIVE POWER, RICHMOND, VA., 1885.

[Classes and capacities of cars, including cabooses, fast-freight, tool, refrigerator and derrick cars.]

Lowest number.
Highest "
Number in service.
" vacant.
Total number.

Numbers never filled in.
Vacant in 1878.
Changed to cabooses.
" " tool.
" " baggage.
" " coke.
" " 8-ton coal.
" " other gondolas.
" " " stock.
" " " box.
" " H. B. gondolas.
Destroyed on East. Div.
" " Hunt. "
" " E., L. & B. S.
" " K. C. R. R.
" " foreign roads.
" no record.
Torn down Hunt. shops.
" " Richmond shops.
" " Covington shops.
" " other points.
Made vacant in the month.
Added during " "

[Ruled with vertical and horizontal lines, with divisions and headings for the three roads, respectively.]

Form of Car Record Book.

Chesapeake & Ohio Railway.

Car No.	1381 box.	1381 box.	1381 box.
Built by	*Ensign Mfg Co.*	Ensign M. Co.	C. & O. Hunt. shop.
Put in service	*June* 12, 1885	July 31, '85.	Jan. 29, '87.
Assigned to	*Kanawha Dispatch*	Kanawha Dis.	Orange line.
Capacity	40,000 lbs.	40,000 lbs.	50,000 lbs.
Light weight	25,700 "	25,700 "	26,000 "
Length over framing	34 ft. 0 in.	34 ft. 0 in.	34 ft. 0 in.
" inside of box	33 " 5 "	33 " 5 "	33 " 5 "
Width over framing	8 " 9 "	8 " 9 "	8 " 9 "
" inside of box	8 " 1 "	8 " 1 "	8 " 1 "
Height above rails	12 " 4 "	12 " 4 "	12 " 4 "
" inside of box	6 " 7 "	6 " 7 "	6 " 7 "
Style of brake	No. 6	No. 6	No. . .Note.
" " drawbar	*Titus & Bossinger*	" 5	" 5
" " roof	*Standard*	" 1	" 1
" " truck	No. 7	" 7	" 7
Size of journal	3¾ × 7 in.	3¾ in. × 7 in.	4 × 8 in.
Measured at	*Ensign* Shops *June* 12, 1885	Ensigns 7-31-'85.	Hunting. shop.
Condition when measured	*New*	New.	New.
		Wagner doors. Allen doors.	Car equipped with Allen and Wagner doors.
Remarks.	*—This car was equipped with the Wagner side and end doors and the Allen flexible grain doors.* *This car was destroyed at Hurricane July 13, 1885. See Form* 415, No. 725.	Note.—*The capacity of this car was changed to 50,000 lbs. See Form* 440, 8-2-'85. *See* 415, *No.* 23.	Westinghouse automatic brake. See Form 440, 2-12-'87.

Form 439.

Chesapeake & Ohio Railway. Car Inspector's Repo

Chesapeake & Ohio Railway.

Car No. .... 1381 ....
Built by .... *Ensign Mfg Co.* ....
Put in service .... *June* 12, 1885 ....
Light weight .... 25,700 lbs. ....
Capacity .... 40,000 " ....
Length over framing .... 34 ft. 0 in. ....
Width " " .... 8 " 9 " ....
Length inside of box .... 33 " 5 " ....
Width " " " .... 8 " 1 " ....
Height " " " .... 6 " 7 " ....
" above rails .... 12 " 4 " ....
Style of brake .... No. 6 ....
" " draw-bar .... *Titus & Bossinger* ....
" " roof .... *Standard* ....
" " truck .... No. 7 ....
Size of journal .... 3¾ × 7 in. ....
Measured at .... *Ensign* Shops, *June* 12, 1885 ....
Condition when measured .... *New* ....
Remarks.—*Car equipped with Wagner doors and Allen grain doors.* .... *Inspector.*

The car must be stenciled in every case when measured.

Form 440.

Ches. & Ohio Railway,
Huntington Shops, *August* 2, 1885.

C. & O. Car. No. 1381 turned out this day was furnished with
New draft rigging on .... ends, No. ....
.... *New drawheads, pattern No.* ....
.... " *center-plate,* " *No.* ....
.... " *draft-spring* .... *diam.* .... *long.*
[*Capacity changed to* 50,000 *lbs.*]
.... truck rebuilt as No. ....
.... new oil box, . . . pattern No. ....
.... " axle . . journal .... inches.
.... " brake-head, . . pattern No. ....
1 *New bolster spring, Graduated.*
This car was damaged at .... and reported on No. .... of Form 416.
JNO. SMITH, Foreman.

Just at this time there is a good deal of inquiry as to when electric motors are to have a trial on the elevated roads.—*American Machinist.*

Why don't such restless, inquisitive people find out where the headquarters of the motors are, and when they have found out, go there and ask the manager about it? If he can't tell 'em, nobody can, and they must wait.

Why Railroad Business is Not Remunerative.

To the Editor of the National Car-Builder:

It is apparent to those who have studied the subject closely, that a crisis in railroad affairs is approaching, if, indeed, it is not already at hand. The very general inability of the roads to earn interest upon their outstanding indebtedness is an evidence that widely operating causes have contributed to bring about this result. A great variety of reasons are assigned to account for the falling off in net earnings. It is generally conceded that much of it is due to competition and the construction of new lines not required by the volume of traffic. There are other causes, however, that are less prominent, and only escape observation because they lie deeper. The purpose of this article is to invite attention to some of these underlying causes.

While it is certain that the roads are not at present making money, it is at the same time not so sure that they can not do so. It is said there is not business enough to keep their equipment employed even at the present low rates. It would probably be nearer the truth to say that the roads are too much identified with Wall street, and so long as they continue to be outlying appendages of that great central arena of speculation, they will continue to hover on the ragged edge of bankruptcy. Delivered from the influence and control of the stock exchange, and managed as legitimate money-making enterprises, the most of them could, even in the present depressed state of business, earn enough to pay operating expenses and interest. The primary fault is obviously in the prevailing system of management. That an improvement in this respect is possible, is manifest from the fact that some exceptional roads that have been operated for the purpose of making money in a legitimate way, and without reference to the market quotations of stocks, have continued to be, and ar still, comparatively prosperous. Superiority of location and an absence of rival lines have had much less to do with their success than might be supposed. The secret of it is in their judicious management, and had some of the great trunk lines that have recently been "paralleled," been as well managed, they would never have had competitors such as they now have.

If the existing roads that are now struggling with adversity are to make money in future, several very radical changes will have to be made in their methods of management and superintendence. After cutting away from the demoralizing influence of the stock market, the next important move is to select for the higher grades of officials men who have a much greater amount of technical knowledge than the majority of managers and superintendents now have. There is abundance of proof accumulating every day, that many of the men who now fill these positions are so deficient in this kind of knowledge as to be unfitted for the practical performance of their duties. There is an old nautical proverb that "the best sea-captains come in at the hawse-hole and not at the cabin windows." This, as applied to railroads, is equivalent to saying that the best manager begins as a water-boy and not as assistant superintendent. Although this practical drill, beginning with the lowest round, is very essential as giving the future officer an insight into subordinate details, it is not enough of itself, and does not go far enough. A good master mechanic can not be made on the foot-board, nor a good master car-builder in the repair yard. In these days a scientific training is necessary, in addition to what can be learned in the shop and on the road. It is owing to the lack of such training in very many cases that those in charge of railroad mechanical departments attempt to run them on what is called "strictly business principles." It is an attempt to run a railroad as a merely conventional "business man" sometimes tries to run a factory. In both cases the results are the same. So long as there is no very close competition, both are successful. But the moment it becomes necessary to economize in order to save a small margin of profit, the business man's factory languishes and the railroad passes its dividend. Yet other enterprises of the kind, under the direction of men with the requisite technical and scientific knowledge allied with good business capacity, manage to survive periods of stagnation and come out right side up. Any number of mistakes resulting from the causes above indicated, might be cited, and which have occurred in railroad mechanical departments. A few of them may here be noted as samples of the general run.

A manager, not long ago, who was quite ignorant of the practical details of car construction, allowed his subordinates to adopt as a standard a style of decoration and finish for the passenger cars of his road which in eighteen months looked old and seedy, nor can it be rejuvenated. Before long some of the younger men connected with the car department of the road will be giving the Car-Builders' Association the benefit of their "experience" in the use of natural woods, by showing that it is unsuitable for cars on "their road," and their road being a big one, this will be listened to with marked deference as the experience of a big road. Nothing is learned from such mistakes, because those who make them do not know they are on the wrong track, and that others, by avoiding the mistake, have succeeded while the big road people have failed. Freight cars are also built under this kind of management, so weak in the center that the load breaks the car's back and cocks up its ends; then a stronger car is built, and a brace is put in to hold the corner down—the first error leading to a greater one in the attempt to correct the mistake.

Another class of errors resulting from lack of knowledge on the part of managers and superintendents, pertains to rolling stock and the losses incurred by its neglect. Passenger cars are kept on the road long after they should have been taken into the paint shop to have the shrinkage cracks stopped, if nothing more. The result is, that the life of the cars is shortened a number of years, more or less; and frequently in time of need they are in such a condition that the road is unable to take advantage of its opportunities.

From replies made to manufacturers who want special sidings built, it would seem that very few superintendents know with any certainty to what extent the road can afford to build such sidings. There is a vague notion that so many cars a day will warrant the outlay for the construction of a siding, but what should be known is the actual number of feet in proportion to the tons of freight.

Probably not half a dozen managers in the country can tell whether it will pay their roads to build a mill and roll their own scrap into bar iron; and it would be difficult to find one who can tell anything about the advantages of having special shapes of all kinds rolled at the same price as merchant bar. If a master mechanic should present the figures and attempt to demonstrate the saving that would result, he would be suspected of doing it from motives of personal and private interest, and no heed would be given to him. Suggestions made by subordinates are not apt to be weighed in reference to their intrinsic value, but by a kind of generalization which takes into account the job which the subordinate is supposed to be working. Even when experiments and tests are resorted to, the results are not clearly understood, and as a consequence, the higher officials do not see in what direction investigation should proceed, but have to depend upon their own imperfect knowledge and such suggestions of their subordinates as may happen to strike them favorably.

In the locomotive departments this relationship between the high road officials and the heads of these departments is practically exemplified. The ignorant superior has to be on his guard as much as possible against his wiser and better informed inferior, who must make suggestions in such a way as not to reflect upon the capacity of those above him; or, in other words, the suggestions must be made to appear as if they were derived from headquarters. Important questions have to be referred, of course, to the master mechanic, who has to do not only his own work, but see that his superior makes proper decisions without giving himself away, as the phrase goes. In this important department the actual head has to say, "By your leave," while the nominal, or, more properly, the figure-head, is lacking in the knowledge that is essential to initiate reforms and adhere to a well-considered policy. The one who has to do the work is so circumscribed in his sphere that he can not do anything in a straightforward way, and he almost necessarily grows narrow-minded. The construction which will give him the least trouble, and which will enable his department to make the best showing, regardless of the interests of the road, is the best for him under such circumstances. Put the same man at the head of the road, or in the place where he belongs, and the case would be different. Then he would serve the road and not a single department of it.

Another trouble resulting from a lack of mechanical training among high officials is the inability to make and preserve the proper records and statistics pertaining to the details and operations of the mechanical departments. Objections are made on account of the expense attending such an undertaking, and other obstacles of one kind and another are thrown in the way. Every master mechanic and master car-builder knows the difficulties experienced in devising anything like a practicable system of car and wheel mileage and things of a similar kind. The objections in these cases have almost invariably come from a source where the importance of records and statistics should have been the most highly appreciated, and from which the efforts to secure them should have received the greatest encouragement.

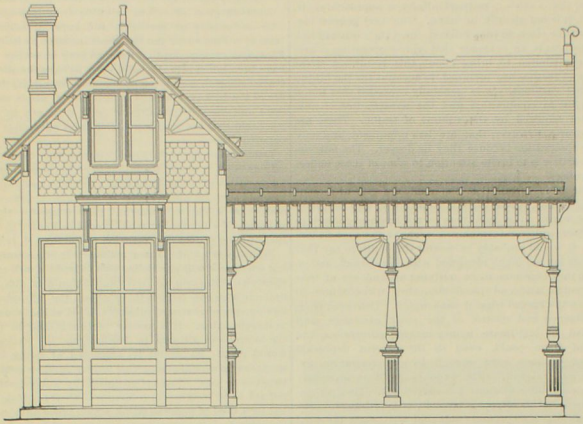
The tenor and drift of this article will not, of course, be misunderstood. It is not intended to be sweeping and indiscriminate, but merely to set forth a prevailing drawback and dead weight upon railroad prosperity at the present stage of railroad development.

B.

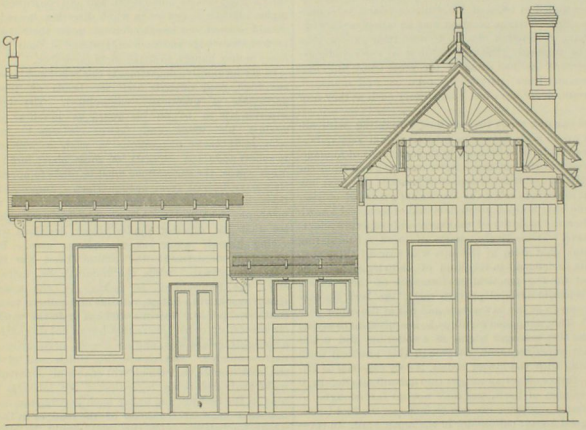
CONSIDERABLE success has been achieved on various street railways with the use of the Thompson car starter. From Mr. L. G. Hanna, of Cleveland, O., agent for the starter named, we learn that it is in use on several street railroads in Cleveland, and gives entire satisfaction. They do not have any trouble with its making horses balky, an objection which has been generally raised against the use of car starters. During the course of a public test recently made of the starter, the car on which it was applied was stopped on a steep hill at a point where there was a sharp curve. The horses could not start the car at that point, but without any help from them the starter put the car in motion, after which the horses easily kept it going.

STANDARD No. 5 PASSENGER STATION HOUSE.

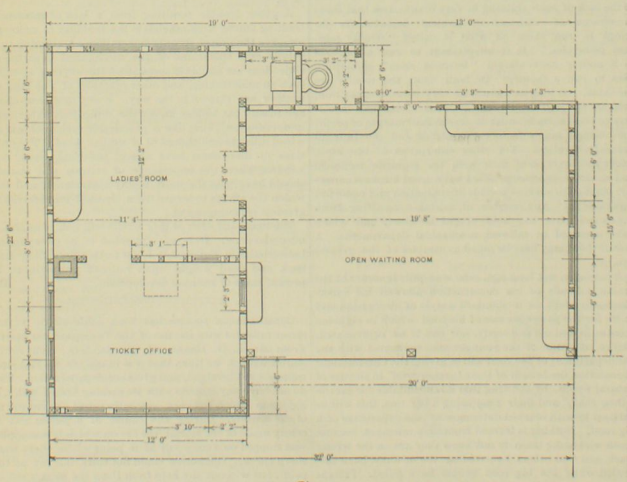
New York, West Shore & Buffalo Railway.



Front Elevation.



Rear Elevation.



Plan.

THE engravings represent the standard "No. 5" station house of the New York, West Shore & Buffalo Railway, designed by Mr. John D. Fouquet, Superintendent of Buildings of the road. It is specially adapted to small suburban and way stations, and has an open waiting room communicating with a "Ladies' Room," the latter room being available in cold or stormy weather. Like all the station houses of this road, a second story is provided in the form of a tower, in which are the signaling and telegraph apparatus. The signal room in this case has a projection under the gable, and three windows commanding the track in both directions and also in front of the station. The arrangement of the building, as shown in the plan, is a very convenient one and gives a much larger accommodation than would be obtained from a building of similar size entirely enclosed. Stations erected on this plan look even better than they appear in the drawings, and when properly painted are very picturesque. On level ground the building is set on piers, which are 36 inches deep by 2 feet 8 inches at the base.

This style of station has been adopted and used by one or two other roads, and is much liked. Its unique character, convenience and picturesqueness, are greatly in its favor, while the small cost for which it can be erected makes it a very desirable structure to take the places of the mere sheds at many of the suburban statiozs on the lines of some of our largest roads.

Combustion in Locomotive Fire-Boxes.

BY ANGUS SINCLAIR.

First Article.

IMPORTANCE OF COAL ECONOMY.

The coal account of the locomotive department constitutes an important outlay in railroad expenditures; it makes a heavy drain upon every railroad in the country. We are told that the man who makes two blades of grass grow where one blade used to grow is a benefactor of the human race. As the quantity of coal provided for the use of mankind is limited, and the means of cultivating a fresh supply are not apparent, it would seem that the man who makes one pound of coal do the work that has generally called for the consumption of one and a half pounds of coal, is worthy of a share of the admiration accorded to the industrious agriculturist. There are locomotives in the country where the coal consumed in the generation of steam is used as economically as knowledge and skill can effect, but these are very exceptional cases. Much has been said and written of late years about proper methods of firing, founded on correct conceptions of the laws that regulate combustion, but the great mass of our locomotives continue to be fired in a way that violates all nature's laws, and a senseless waste of coal is the result. The opportunities for firemen mending their ways and earning the distinction of being public benefactors, to say nothing of being better worthy of employment, are innumerable.

WHERE THE RESPONSIBILITY FOR BAD FIRING RESTS.

Unfortunately, ignorance of the laws relating to the combustion of coal is not confined to firemen and men of similar rank. The higher railroad officers, whose duty it is to supervise the work done by enginemen, are in too many instances unable to detect shortcomings of their subordinates through want of technical knowledge. If these men would devote more time to studying the principles of combustion, the knowledge gained would redound to the advantage of railroad companies.

VALUE OF CHEMICAL KNOWLEDGE.

Practical men are, as a rule, too ready to underrate the value of information that has to be obtained by study of books; but a knowledge of the principles of combustion can not well be reached in any other way, for life is too short for men engaged in other pursuits to acquire abstruse chemical knowledge by original investigation. The burning of bituminous coal represents a most complex chemical phenomenon, and considerable acquaintance with the laws that regulate the combination of gases is necessary before a man can follow the process intelligently. And unless he understands the nature of combustion he is not likely to be very successful in arranging the details of furnaces where coal has to be burned. A master mechanic who does not understand the laws relating to combustion is like a physician who is ignorant of the laws of hygiene. Both men may follow their business and make a living at it, but neither is a credit to his profession.

WEAK OBSTACLES DETER STUDY.

Many men are deterred from entering upon the study of chemistry relating to combustion on account of the formidable names of gases, and the strange chemical terms that meet them at the start. A very little perseverance and courage will vanquish that lion in the path, which proves a very weak obstacle when firmly grappled with. After once engaging in it, every hour devoted to the study will bring ample compensation in the shape of extended knowledge. Without a knowledge of how the processes of combustion are carried on, a master mechanic is not only deficient in information directly relating to his constructive business, but he is continually liable to become the victim of patent furnace quacks, who often succeed in imposing upon railroads appliances recommended to pro-

mote combustion, which in operation act contrary to nature's processes.

COMPOSITION OF MATTER.

The chemical investigations of many scientists have shown that all substances found in the earth, the air and the sea, whether they are of mineral, of vegetable or of animal origin, may be divided into two great classes—simple bodies or elements, substances out of which nothing different can be got; and compound bodies formed from two or more of these elements. There are about sixty-five elements that have been so far identified. Some of the elements are gaseous, some are liquid, and others are found in a solid condition, at ordinary temperature.

Only fourteen of the elements are of common occurrence, and of these the great mass of the earth with its atmosphere and water are composed. The remainder occur only in comparatively small quantities, and fully one-third of the whole number are so rare as not to admit of any useful application.

Chemists usually designate the elements by their physical appearance, as metallic and non-metallic. A few of the best known non-metallic elements are oxygen, hydrogen, nitrogen, carbon, sulphur and phosphorus; a few of the most familiar metallic elements are iron, copper, zinc, gold, silver, tin, lead and mercury.

CHEMICAL COMBINATIONS.

The elementary substances unite together to form compound bodies which are generally very unlike any of the elements they came from. Thus, oxygen and hydrogen unite to form water. All chemical combinations take place in fixed quantities, the water, for instance, being formed by 8 parts by weight of oxygen combining with 1 part by weight of hydrogen.

The cause of chemical combination is a matter of pure speculation, but it is supposed to occur through the agency of an attractive force, acting only between the atoms of dissimilar substances, and only at insensible distances. This force is spoken of as chemical affinity.

ELEMENTS IN COMBUSTION.

The elements which perform the principal operations in combustion are oxygen and carbon. Carbon is the combustible, and oxygen is the supporter of combustion. To call one of the elements a combustible and the other a supporter of combustion is not chemically correct, but it is a convenient way to designate them in describing furnace combustion. Carbon is the principal element found in trees and in all woody fiber, and it has a strong affinity for oxygen at certain high temperatures. It is supposed that the high temperature is necessary to enable the atoms of oxygen and carbon to get close enough to come under the influence of the attractive force. Wood may remain immersed in oxygen gas for years, and there will be no trace of chemical action; but raise the temperature to the point of ignition, and the two elements combine violently with evolution of great heat and light. Physicists have proved that heat results from the forcible impact of all bodies. It is believed that when elements combine, the atoms are put in rapid motion, hammering against each other, and that the heat, so useful to man, results from this clashing of atoms.

The element, hydrogen, so well known as a constituent of water, is also a combustible, and evolves great heat by combining with oxygen to form water. Hydrogen is not found free in nature, but it appears associated with carbon in numerous compounds, and as such makes valuable fuel.

SLOW AND RAPID COMBUSTION.

There are many other combustible elements besides those mentioned, such as sulphur and phosphorus, but none of them are ever likely to be used for the commercial generation of heat. The rotting of wood and the rusting of iron are familiar instances of slow combustion, while the explosion of gunpowder, dynamite or gun-cotton, are cases of violently rapid combustion.

SOURCE OF OXYGEN USED IN COMBUSTION.

The oxygen required for furnace combustion is drawn from the atmospheric air, which consists of oxygen and nitrogen in mechanical combination in the proportion of 8 to 26.8; or 1 pound of oxygen to 3.35 pounds of nitrogen; or by volume, 1 cubic foot of oxygen to 3.76 cubic feet of nitrogen. For every pound of oxygen employed in combustion 4.35 pounds of air are consumed; or, by measure, for every cubic foot of oxygen employed in combustion, 4.76 cubic feet of air are consumed. Nitrogen acts entirely as a dilutent to the oxygen with which it is associated, and it performs admirably conservative functions in nature; but for furnace combustion nitrogen is too freely represented and impedes economical fuel consumption in various ways. The large volume of this neutral gas accompanying the vital oxygen has to be heated to the highest furnace temperature, which represents considerable expenditure of fuel. Its presence also obstructs the direct contact of the oxygen and carbon, and leads part of the gases to pass off uncombined.

COAL.

At a remote period of time, the earth produced an enormous growth of forest trees and other kinds of vegetable matter, which, through convulsions on the surface of the globe got covered over with earth and rocks. Protected by this thick covering from the oxidizing influence of the atmosphere, and compressed by the superincumbent weight, the imprisoned matter solidified into coal. A process analogous to the original formation of the coal beds may now be seen in the vegetable deposits being made by rank tropical growth of plants, and in the peat formations common in various parts of the world. The lignite found in so many parts of the United States, is a material apparently midway between wood and coal. Coal, being fossil wood that has gone through various physical changes induced by pressure and heat, contains all the elements found in wood, besides numerous impurities drawn from the surroundings of its subterranean bed.

BITUMINOUS COAL.

The ordinary run of American bituminous coal contains from 50 to 75 per cent. of fixed carbon, which is the coke of the coal, and from 12 to 35 per cent. of volatile combustible, the latter being composed of substances resembling pitch, which burn with a lurid flame and supply the ingredients of coal gas. These inflammable substances are known as hydro-carbons, since they consist of different combinations of hydrogen and carbon. Mixed with all kinds of coal there are earthy and mineral impurities consisting of silica, alumina, iron, sulphur and saline matter, most of which do not burn, but remain behind as ashes.

ANTHRACITE COAL.

Anthracite coal differs from bituminous coal in this respect, that it consists principally of fixed carbon with but little volatile matter left in its composition. Good anthracite coal contains about 90 per cent. of pure carbon. The volatile substances are supposed to have been expelled by the action of heat.

The coal used for locomotive boilers in the United States ranges from low-grade bituminous coal that closely resembles lignite, up by imperceptible gradations to nearly pure carbon, as found in the best anthracite coal. Each different grade of coal ought to receive treatment in firing adapted to its chemical composition, but in most cases all kinds of coal are treated alike. In the succeeding articles I shall try to portray the effect of this promiscuous practice and suggest improvements.

Chicago & Northwestern Railway Shops.

The Chicago & Northwestern Railway has long been celebrated among railroads of the West for the highly efficient condition in which its rolling stock and machinery are maintained. From what the writer saw during the course of a day recently spent in examining the splendid shops at Chicago, there seems to be no danger of the old-time high standard deteriorating.

The impression that a mechanic receives in going round these shops, examining the machinery and watching the work done, is that Mr. Geo. W. Tilton, Superintendent of Motive Power and Machinery, follows very conservative methods in his construction work, and that his policy is to have every article turned out for locomotives, cars or track, first-class in material and fit. Merely ornamental finish is nowhere conspicuous.

Nearly all the work for the rolling stock and structures belonging to the 3,843 miles of railroad comprising the Chicago & Northwestern system is done at the Chicago shops. Few railroad companies are provided with equal facilities for turning out work quickly and well. Like most other great railroads, however, that have been formed from a number of small lines, this company started out with poor shops in crowded quarters, and the machinery department struggled for years with the inconveniences of shops in the heart of Chicago, planned for one-tenth the work they were required to do. By the year 1873, the inconvenience of the old shops was becoming so expensive that the company purchased 250 acres of land on the side of the track on the Galena Division, five miles out from the terminus, where the present shops were built two years later. A respectable-sized town has grown up on the prairie around the shops.

The shops consist of about twenty distinct buildings arranged on a preconceived plan, in a rough parallelogram alongside of ample sidings that border the main track. Going to the extreme western part of the yard, we found that part was devoted to the storage of lumber and rough material. All material enters the shops at that end, and the plan is to work it towards finish as it is moved eastward. The extreme western building is the lumber-drying kilns, which are capable of drying 50,000 feet of lumber a day, but are seldom required to turn out that quantity. Next is the planing mill, which an enthusiastic foreman averred was the most complete shop of the kind west of Pittsburgh; Pullman not excepted, he emphatically added. While going round these shops we were several times impressed with the confident way that workmen expressed or implied the belief that the Chicago & Northwestern Railway was the best railroad in creation, and the Chicago shops ahead of any thing in their line. We could conscientiously agree with them about the shops. In making a most thorough examination of the wood-working machinery, we were under obligation to Mr. Wm. Campbell, the Master Car-Builder, and his principal foreman, Mr. G. L. Irwin, for patiently-made explanations of how complex wood-working operations were performed.

On entering the planing mill, which is a two-story building, 80 × 308 feet, one of the first machines which attracts our attention is a planer that takes in a rough timber, 5 × 8 inches and 34 feet long, and finishes all the sides in one minute. The timber is passed along to another machine, where the tenons are cut, the holes bored for joint bolts, and the ends sawed off within another minute. The machine that performed the latter series of operations was one of the wonderful products of the J. A. Fay & Co. Works, that seem to do the work of an army of skilled carpenters, and do it with an accuracy that few hands can equal. From witnessing the great variety of machines doing wood-finishing work in this building, we were puzzled to see what was left in the way of hand work. An enumeration of the machinery of the building looks like a tool-dealer's catalogue. In the matter of saws alone, the shop has a bewildering variety. We noted down the presence of 3 band saws, 1 scroll saw, 1 cross-cut adjustable saw that could be made to work on any required bevel. There were 4 circular saws that made pretense to no exclusiveness in their operations, but tore open any kind of timber that came along. There was 1 plain cross-cut saw, 4 cross-cut swing saws, 5 rip saws and 1 large swing saw for scrap work that is in the habit of raising no objection to cutting spikes and ¾ bolts, with an old axle-box thrown in occasionally. The saw list closed with a saw-filing machine with capabilities of teeth-regenerating that would make a dentist yellow with envy, its work being supplemented by the action of a saw-gumming machine. There are two Daniel planers and a variety of other kinds of planers, besides numerous mortising, tenoning, shaping and molding machines. There are many turning lathes in the shop, and different kinds of boring machines and gainers. In short, it is a shop furnished with all kinds of the latest designed wood-working machinery, adapted for car-building operations.

We were shown some very handsome specimens of veneering work by Mr. Irwin, who claimed to be the first man in the West to make veneers for car work. A great portion of the ornamental work put upon the passenger cars is done in the shops, some of the workmen displaying fine artistic taste in their productions. We saw some elaborate specimens of hand carving which the men were at work upon. All cabinet work and light operations in wood-working are done in the upper story of the planing mill, which is well equipped with the lighter grades of machinery. The pattern making is done there, and the shop is provided with every facility for getting out work promptly.

The planing mill is built parallel to the track and alongside of it another building of the same size stands, which is the iron-working machine shop and the blacksmith shop of the car department. In the machine shop, there are 12 bolt cutters and nut-tapping machines, 8 drill presses, 4 common engine lathes, 6 axle lathes, 3 wheel-boring machines and 1 wheel grinder, besides hydraulic presses, emery wheels and other small tools. Among the axle lathes, we observed two double-headers which were standing idle. This is the condition in which we have found most of the double-headed axle lathes we have seen in various shops.

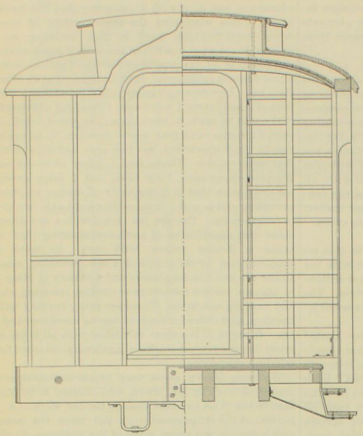
The blacksmith shop is also well provided with power aids to work. There are 16 fires and 2 coke furnaces. Two power shears, 2 punches, 1 trip hammer, and 1 steam hammer are in use. The foreman, Mr. C. C. Neimeister, is a mechanic with advanced ideas, which he applies to facilitate his work. He has numerous formers and labor-saving devices that make this shop more worthy of close inspection than the ordinary run of blacksmith shops. Mr. Neimeister invented and patented many years ago the wrought-iron draw-head used by this road; and he claims that the Pennsylvania Railroad appropriated it without paying royalty.

Passing eastward from the machine shops of the car works, we pass in succession five shops, each 80x302 feet, set at right angles to the track and connected by transfer tables or by tracks. These are the car building, repairing, and paint shops. There is not a great deal of work going on for the size of the place, principally because the cars belonging to the road are in unusually good order, and the business does not call for rapid increase by renewals. They have recently turned out a lot of new furniture cars that are 38 feet long over sills, 8½ feet wide, and 8 feet 5 inches high from sills to bottom of plate. These are the largest freight cars that have been built in this district. They are building 16 stock cars, 30 feet 8 inches long over sills, also some coal-dumps, turn-tables, water-tanks and various articles belonging to road structures. At present the company owns 21,054 cars in all, 581 cars belonging to passenger equipment. Last year rebuilding and repairing cars cost the company $245,863. The greater part of this vast equipment of cars have got trucks, draw-bars and other parts made according to the recognized standard of the road. It will take some time for this and many other great roads to change to the Master Car-Builders' standards if ever the latter Association reaches a standard truck and draw-bar.

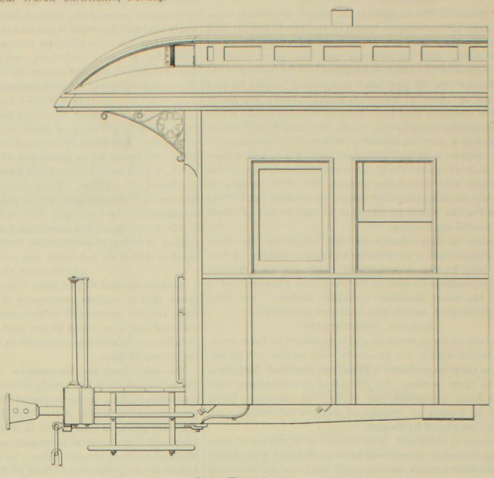
Beyond the car and paint shops, after passing through an open yard, we reach the locomotive machine shop, which is the largest building connected with the establishment and is 120 × 552 feet. It is a single-story building, lighted from roof and sides. The metal-working machinery is placed on one side of the building and the locomotive-repairing stalls on the other side, a standard-gauge track traversing the whole length of the shop. To enumerate the machines would be merely mentioning the names of all the most approved ordinary and special tools now made for locomotive work. In connection with the shop there

NORWEGIAN SECOND-CLASS SLEEPING CAR,

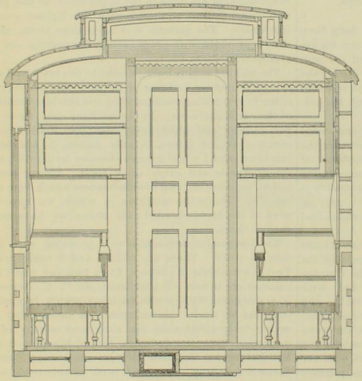
Built at the Skoba Car Works, Christiania, Norway.



End Framing.



Side Elevation.



End View.

is an excellent tool room containing a first-class assortment of standard tools, besides the means of proving that they do not get out of standard size. There is also a good assortment of templets and gauges.

Seventeen locomotives are at present in the machine shop undergoing repairs. In several instances the work being done is almost equivalent to renewal. Three receive new fire-boxes and one a new boiler. Some very heavy repairs were effected on locomotives last year. Seven were rebuilt at a cost of $42,146. The cost of repairing the whole 672 locomotives belonging to the road was $849,572.

Norwegian Sleeping Car.

THE engravings represent the floor plan, framing and interior arrangement of a Norwegian sleeping car. The blue prints sent us, and especially the photographic views of the interior construction and finish, are of superior excellence as compared with the average specimens of similar work in the United States.

The car, as will be seen, combines the leading features of both English and American construction. The end platforms, central passage-way and buffers, and continuous floor timbers with transoms resting on 4-wheel trucks, are thoroughly American, while the interior is divided into compartments. Eight floor timbers are used forward of the bolsters, two of which take the place of platform or draw-timbers and carry the buffer between them. The other six are framed in the usual way, except the side and end sills, which are put together with angle-irons and mitered joints. The side sills are 4½ × 7″, and the others 4 × 6½″. The platform timbers are 8½″ thick by 8½″ deep; those at the sides extending only to the cross-blocks a foot back of the end sill. The timbers carrying the buffer and draw-spring take direct hold of the bolster and appear to be halved on to the end sill. This brings the drawing and buffing strains on a level with the lower edge of the sills. The plate and window-rail in the side framing are of large dimensions. The raised deck has double windows, the intervening space being about 6″—suggesting a cold climate. The truss planks are 2″ × 9″; they rest on the floor and are rabbeted to take the inside finish. The corner-posts are composite, being made of three pieces. They are secured to the sills by angle-irons, while the posts are supported by a diagonal rod in the frame, running back apparently to the heavy window-post, another rod beneath the sill transmitting the strain to the bolster.

Although the car is called second-class, the inside finish is in polished wood throughout. Above the heads of the passengers are broad nets, made apparently of white twine, and supported by brackets. Aside from these brackets there is but little polished metal work. The arrangement and size of the seats in the compartments are shown in the plan, the aisle or passage-way being a little to one side. Each compartment seats six persons. There are no upper berths. The wide seats are divided in the center by an upholstered arm, not shown in the cuts. The door-opening is about 25″ wide in the clear. The compartments are separated by tongued and grooved partitions. The heating is by stoves suspended underneath the car, from which flues protected by non-conducting material are carried between the floor timbers, as shown in the end view. Ventilation is secured by means of a peculiar double hood shown in section in the side elevation, one to each compartment. The window glass is 17″ × 25″.

This construction is an interesting example as showing to what extent two antagonistic systems can be harmonized. The manner in which the wide English seats are carried forward and supported to form the bed, without interfering in any way with their comfortable use during the day, is very ingenious, and might be adopted with advantage on some of our American cars. The strong partitions, bracing roof and sides together, add very materially to the stiffness and strength of the car.

Locomotive Performance on the Pittsburgh, Cincinnati & St. Louis Railway.

During the month of June, this road had 260 locomotives in service on its several divisions. The passenger engines made an average of 4,372 miles, but some individual engines did much more work than these figures represent, five of them running over 7,000 miles during the month. The freight and switching engines ran about 100 miles each day, Sundays included. On the 1st, 3d and 5th Divisions, of which Mr. Robert Curtis is the Master Mechanic, and Mr. John Pontius road foreman of engines, the work was done with an average of 65.7 pounds of coal per train mile. Passenger engines on these divisions used 45.7 pounds per train mile.

On the 2d and 4th Divisions, of which Mr. W. W. Reynolds is Master Mechanic, and Mr. John L. Donaldson road foreman of engines, the average of coal used was 62.5 pounds per train mile, the passenger engines using 49 pounds per train mile.

On the P., C. & St. L. Division, of which Mr. C. B. Street is Master Mechanic, and James Bruce and D. P. Tait foremen of engines, the average coal consumption per train mile was 66 pounds, the passenger engines using an average of 43 pounds.

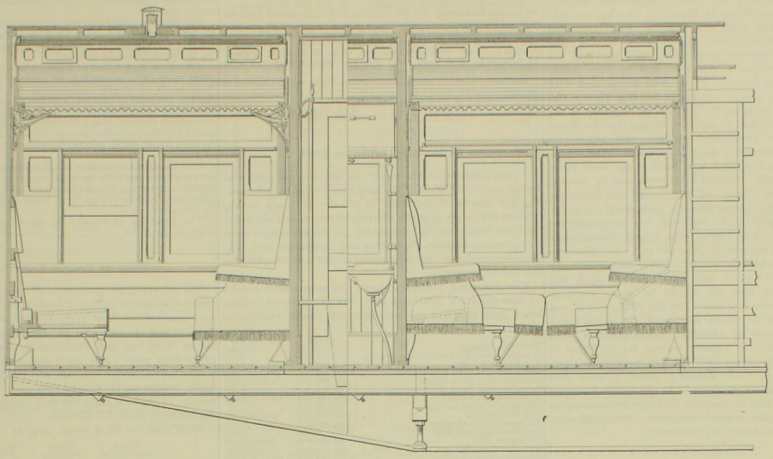
On the Jeffersonville, Madison & Indianapolis Division, where Mr. Wm. Swanston is Master Mechanic, the average coal consumption per train mile was 46.4 pounds, passenger engines using 35.5 pounds per train mile. Of these, three did their work with less than 30 pounds of coal per train mile. The average passenger train was 3.1 cars. Although the trains on this division were light, they were moved very economically. Few roads in the country can equal the record made.

On the Indianapolis & Vincennes Division, where Mr. Wm. Swanston is Master Mechanic and Mr. James Landers road foreman of engines, the mileage per ton of coal was 43.29, the passenger engines using 36.9 lbs. per train mile.

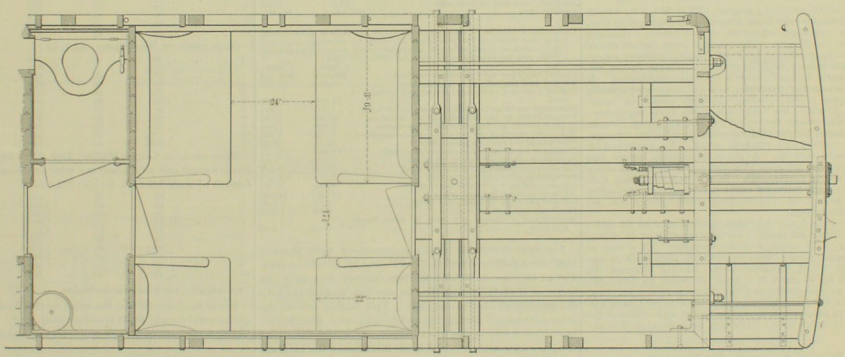
On the Little Miami Division, where Mr. Leroy Kells is Master Mechanic, the average coal consumption was 48.22 pounds per mile for 41 engines. The passenger engines used 39.2 pounds per train mile. Mr. Kells has also charge of the C. & M. V. Division, where on average the locomotives used 53.3 pounds of coal per train mile, the passenger engines using 39.2 pounds.

These divisions are all under the supervision of Mr. Edward B. Wall, Superintendent of Motive Power, who has good reason to be proud of the performance of the locomotives. A very strict account is kept of the coal used, and the enginemen are closely looked after, so that when extravagance is apparent, it is checked.

These records are taken from the excellently arranged performance sheets prepared by Mr. W. B. Waggoner, motive power clerk.



Section of Compartments.



Plan of Section and Floor Frame

Western Railway Club.

The regular monthly meeting of this club was held at Chicago, August 19, Vice-President Stevens presiding. There were twelve members present.

LUBRICATING LOCOMOTIVE VALVES AND CYLINDERS.

Mr. Angus Sinclair being called upon to open the discussion, spoke of the various methods in use for lubricating locomotive cylinders, and preferred the system where a regular supply of oil is kept up. He thought that the fluctuating style of oiling valves wasted oil by giving a surplus at the time it was put on, and afterward led to waste of power by letting the valves run dry. He had, in running, stalled on a hill and backed to oil the valves, then gone over, which indicated that great power was wasted in operating dry valves. The increase in the size of valves and in the steam pressures carried, demand that a regular supply of lubricant be provided. With that and balanced valves, there would be very little power absorbed in moving the valves.

Mr. Allen Cook had not used any lubricators for cylinders except steam-chest and cab-cups. He was favorably impressed with the sight-feed cups, and wished to hear from some one who had used them.

President Stevens said the Lake Shore road had been putting sight-feed cups on quite largely, and he agreed with Mr. Sinclair as to the advantage of employing that system of lubricating valves. The experience they had had with these cups indicated a saving of from 6 to 10 per cent. over the old way. He believed there was a great deal to be saved, both in the engine's working and in material, by the use of good lubricating devices. They had now 200 or 250 engines equipped with sight-feed cups.

Mr. Cooke asked if they ever had trouble with the cups stopping to feed on the road, and was answered in the negative.

Mr. Verbryck wanted to know what lubricant was generally used for engine valves? On the Rock Island road he believed they used "Perfection valve oil."

Mr. Cooke had used a great many valve oils, but never found anything quite so satisfactory as tallow. It might be better to have the tallow rectified to take out the acid.

Mr. Stevens had never heard anything against tallow, except its corrosive tendency. But he said there is more waste in giving out tallow than with oil.

Mr. Sinclair had found the doctoring of tallow with bicarbonate of soda took away its corrosive action. He found tallow rather better for lubricating cylinders than any kind of oil.

Mr. Toppin said the acid of tallow could not be removed without destroying the lubricant. Many chemists, here and in Europe, had tried to neutralize the acid and had never succeeded.

SEATING OF CARS FOR SUBURBAN TRAFFIC.

Mr. Verbryck described some suburban cars he had built a few years ago with some seats set crosswise in the middle of the car, and the others set along the side. The middle seats were not made reversible. They were practically the same kind as those used on the elevated railroads of New York. When these cars were put into service a great outcry was made against them. The patrons of the road put in a request, to the general manager, that the cars be taken off. The seats were made of rattan, and they found a great deal of fault with that, and also about the middle seats facing each other. The cars were kept running, and he is building three more of the same kind and seating them in the same way, except that in the centre of the car the cross seats are made reversible, so that people will not have to sit facing each other.

Mr. Wilson noticed that on the Illinois Central Railroad, when people began to enter the suburban trains, a rush was always made to get possession of the cross seats. That shows they like them better.

Mr. Verbryck agreed that people liked the cross seats, but this preference could not be deferred to with suburban cars, for they must be made in the way that facilitates ingress and egress.

Mr. Patriarche alluded to the inconvenience that some people experience, especially ladies, in riding backward. It makes them feel sea-sick. As suburban trains were greatly patronized by ladies, he thought their taste in the matter should not be ignored. When seats were made so that they could not be turned over, there was also the likelihood of objectionable people sitting down opposite ladies.

The President asked Mr. Verbryck how rattan seating compares with plush?

Mr. Verbryck said for suburban cars he liked it much better than he did plush. It is easily kept clean and wears well. The cars he had running were turned out in 1881, and he had never yet had to repair the first seat. Some one put a knife through a seat, and he had to fix that, but the seats otherwise are apparently as good as they were the day they were put in. He believed they would wear longer than plush, besides being easily washed off and kept clean. There was no chance for vermin or anything of that kind to get in, and no trouble with dust, as in other seats.

Mr. Tracy had noticed that the doors of the Brooklyn Bridge cars were very wide, so that people got in and out quickly. He wanted to know if the doors and platforms of suburban cars could not be made wider.

Mr. Verbryck said the doors might be made wider, but widening the platforms would not be so easily done, as there would be trouble in keeping them up so the couplings would be on the proper level.

Mr. Patriarche asked if any one had seen cars for suburban traffic with wide sliding doors on the sides, so they could be emptied of passengers quickly.

Mr. Tracy was familiar with the English method of admitting passengers at the sides of cars. He was in London at the time the New York elevated roads were opened, and Englishmen assured him that operating these roads would convince Americans that side doors were necessary for crowded city travel. He doubted the truth of this, and timed about 200 stops on the Metropolitan Railway and found they averaged 18 seconds. On returning home he timed the stops on the New York elevated roads and found they averaged 7 seconds.

The Oldest Locomotive Engineer.

From Mr. P. J. Cochrane, Master of Machinery of the South Carolina Railway, we have learned some particulars about Engineer Henry G. Haworth, who has recently retired from active work after having been connected with the above-named road almost since it was commenced in 1830. For the last 33 years, Mr. Haworth has run a pusher engine on Aiken Hill, and he now retires owing to declining health. Those well acquainted with American railway history will remember that Henry Haworth succeeded Nicholas W. Darrell as engineer of the "Best Friend," the first locomotive owned by the South Carolina Railway Company, and the first locomotive built for regular service in the United States. The engine had a vertical boiler, and was built at the West Point Foundry, New York. Shortly after being put in service, and while still in charge of Mr. Darrell, the boiler exploded through the colored fireman weighting down the safety valve lever while the engineer was arranging the cars of his train. The engine was rebuilt immediately afterward and a horizontal boiler put in. Mr. Haworth was a machinist with a firm in Charleston that rebuilt the engine, and he did a great part of the work, so it was considered proper that he should be made engineer when the locomotive was ready for the road, which was in 1831. There is no doubt that he is the oldest living locomotive engineer in America. David Matthew, who first ran a locomotive in regular service in the State of New York, is still living, but he was working as a machinist at the West Point Foundry nearly a year after Haworth was running regularly. As the South Carolina Railway was the first in America to begin running trains with locomotives, the pioneer engineers of that road were the pioneers on the American continent.

Efficient Locomotive Service.

Mr. J. E. Phelan, a locomo.ive engineer running on the Northern Pacific Railroad, writes to the *American Machinist* a letter from which we cull the following:

"I run a 40-ton standard engine, 17″ × 24″, 5 ft. wheel, built at Portland works from dimensions furnished by Geo. W. Cushing, our superintendent of machinery; Baldwin patterns for machinery. This engine was turned out of Brainerd shops, managed by H. Z. Small, assistant superintendent machinery, and his general foreman, James McNaughton, early in April, after a general overhauling. It had soft bearings for journals, and oil cups with spindle feed on engine truck, feeding through center of brass directly on journal; an 8-inch air pump with regulator; sight-feed lubricators for cylinders and air pump; steam jet arrangement for preventing smoke, and other arrangements for comfort and efficient work. No improved oil holes for valve motion. A piece of writing paper can barely be inserted between gibs and guide bars, and other parts are fitted to correspond. In the month of May this engine made 4,155 miles on night passenger run, averaging 30 miles to pint of oil; subtracting illuminating oils we made 37 miles to pint.

"Early in June I ran this engine on a special 64 miles without shutting off steam; another stretch of 66 miles; still another of 70 miles without stopping. In a run of nearly 500 miles made between daylight and dark in one day, on arrival at terminal point, having covered the homestretch for 40 miles at a good 50 miles an hour, the engine was as cool and in as good shape as when starting, having made 419 miles to one quart of valve oil; used machinery oil in proportion to May average, and covered the returning 218 miles with a little less than 2½ tons of coal."

Trial of Automatic Car Couplers.

We are requested to call attention to the following circular, which supersedes the one dated July 25 and printed in our August number. The corrections made in the new circular are mainly the insertion of the names of J. S. Hammond in place of F. M. Wilder as the receiver of cars at Buffalo, and M. N. Forney, Secretary, New York, in place of F. M. Wilder, Buffalo, as the one to whom statements, etc., are to be sent:

CIRCULAR.

NEW YORK, August 1, 1885.

The Executive Committee of the Master Car-Builders' Association, acting in accordance with the general instructions given by the Association at the last Convention, will make a public trial of Automatic Freight Car Couplers at Buffalo, N. Y., on Tuesday, September 15, 1885.

The Executive Committee will be guided by the results of their trial in recommending several forms of couplers to the railroad companies for further test in actual service. They will watch the behavior of those selected couplers until one month prior to the next Convention of the Association, when they will prepare a report, and may recommend for universal adoption one or more different forms of Automatic Freight-Car Couplers.

All parties desirious of presenting Freight Car Couplers to the consideration of the Master Car-Builders' Association are invited to participate in this trial.

The following requirements must be complied with:

The couplers must be attached to each end of two freight cars—preferably box cars; both cars must be forwarded, freight prepaid, to J. S. Hammond, Agent New York, Lake Erie & Western Railroad, Buffalo, N. Y. Any additional charges for switching, etc., will be charged against the cars before they are billed home, and should be paid by the consignee or party interested in the device. Full drawings and specifications, together with letters patent, and any opinions on the device that may have been given by the Eastern or Western Railroad Association, or by the courts, and also a statement of the numbers and initials of cars equipped with the coupler and already in service, must be forwarded to the Executive Committee of the Master Car-Builders' Association, care of M. N. Forney, Secretary, 71 Broadway, New York, prior to September 15. All cars intended for this trial should be on hand in Buffalo by Saturday, September 12, so that the committee can have a full list of them.

The committee will not consider or investigate the merits of couplers represented only by models, drawings or other descriptions. An imperative condition of the trial will be that couplers submitted to the committee *must be applied to two cars* so that they can be tested at the time and place named.

The Executive Committee is not prepared to assist inventors or owners of patents on car couplers in procuring cars to be equipped and delivered at Buffalo ready for trial. Negotiations of this character must be conducted directly between the owners of the couplers and the railroad companies. It will also be necessary for parties furnishing cars for this trial to arrange direct with the railroad companies for their return.

Notice of intention to take part in the trial, giving the numbers and initials of the two cars that will be forwarded, should be addressed to Edwd. B. Wall, Columbus, Ohio, or to M. N. Forney, 71 Broadway, New York, who will also answer inquiries with reference to the proposed trials.

Railroad Commissioners of the various States will be invited to be present at this trial.

By order of the Executive Committee.

M. N. FORNEY, Secretary.

Railroad Operation in 1884.

"Poor's Manual of Railroads" for the current year was issued early in August. The usual statistical tables showing the details of operation of all the railroads in the United States are given in the Introduction, and are made up from reports of the companies for the respective fiscal years ending in June, September and December, 1884. The details of mileage and new construction are complete for the calendar year.

The following summary shows the comparative results of operation for 1883 and 1884, the quantity of rolling stock, and averages per mile of stock, bonds, cost, earnings, etc.:

	1884.	1883.
Total line mileage	125,379	121,592
Mileage constructed within the year	3,977	6,753
Total track mileage	156 496	149,182
Gross receipts from passengers	$206,790,701	$215,287,824
Gross receipts from freights	502 869,910	549,756,695
Gross receipts from other sources	61,024,297	58,728,405
Total gross receipts	770,684,908	823,772,924
Decrease in gross receipts	53,088,016	....
Net earnings	268,106,258	293,367,285
Decrease in net earnings	25,261,027	....
Gross earnings per mile	6,663	7,461
Dividends paid	93,244,835	102,052,548
Passengers carried (not inc. N. Y. Elev.)	334,814,529	312,686,641
Passengers car. 1 mile "	8,778,581,061	8,541,309,674
Charged per passenger per mile (cents)	2.356	2.422
Tons of freight transported	390,074,749	400,453,439
Tons of freight transported 1 mile	44,725,207,677	44,064,923,445
Average rate per mile (cents)	1.124	1.24
Steel rails in track (miles)	90,242	78,490
Locomotives	24,587	23,823
Passenger cars	17,993	17,899
Baggage, mail and express cars	5,911	5,948
Freight cars	798,399	748,661

Comparative statement showing the averages per mile of stock, bonds, cost and earnings, percentage of expenses to earnings, earnings per passenger train-mile and per freight train-mile, per passenger-mile, and per tonnage-mile etc., for 1883 *and* 1884:

	1884.	1883.
Capital stock per mile of completed road	$38,064	$30,759
Bonded debt per mile of completed road	29,317	28,650
Cost of road and equipment per mile of completed road	55,329	55,461
Passenger earnings per mile of road in operation	1,801	1,951
Freight earnings per mile of road in operation	4,382	5,092
Gross earnings per mile of road in operation	6,663	7,641
Net traffic earnings per mile of road in operation	2,318	2,702
Percentage of expenses to earnings	65.21	63.78
Passenger earnings per passenger train-mile	$1.001	$1.11
Freight earnings per freight train-mile	1.502	1.56
Earnings per passenger per mile, cents	2.356	2.422
Earnings per ton per mile, cents	1.124	1.236
Average distance per passenger, miles	26.24	27.32
Average distance per ton, miles	114.66	110.04
Interest per cent. of bonds and debt	4.51	4.59
Dividends per cent. of stock	2.48	2.75
Interest and dividends per cent. of stock, bonds and debt	3.52	3.68

The most noticeable results as compared with those of 1883, are a falling off of 10,378,680 tons of freight moved, and an increase of 660,284,232 tons moved one mile; an increase of 22,127,888 passengers carried, and of 237,271,387 passengers carried one mile. The falling off in the gross earnings of passengers and freight was $53,088,016, nearly all of which was from freight. It is stated that had the passenger rates for 1883 been maintained for 1884, the earnings from this source would have been $5,826,532 more than they were, and had the freight rates been maintained in the same way, the earnings from that branch of traffic in 1884 would have been $50,824,141 more than they were; and had the rates of 1883 been kept up for both passengers and freight, the gross earnings would have been $56,840,463 more than were actually received, and $3,752,447 more than in 1883—a significant commentary on rate wars, competition and "parallel" construction.

Discussing the Rules of Interchange.

A meeting of the Buffalo Master Car-Builders' Club was held at the International Hotel, Niagara Falls, August 12, at which the revised rules governing the interchange of freight cars were discussed.

Mr. Marden, of the Fitchburg road, was of the opinion that Rule 12, which relates to the splicing of broken or injured sills, is intended more for the protection of the road owning the cars than for the guidance of the inspectors at interchange points; the idea being that the roads owning cars should have the opportunity of refusing to receive their own cars when not properly repaired on foreign roads. Mr. Kirby, of the Lake Shore road, favored a more liberal construction of the rules, especially where they affected the dispatch of freight. It was shown that a number of the roads represented at the meeting had cars with sills spliced at various points between the end sills and body bolsters, and that one or two of the roads had put splices nearer the bolsters than 12 inches. The discussion resulted in the adoption of the following resolution:

Resolved, That it is the sense of this meeting that, in the interpretation of Rule 12, inspectors should pass all cars with spliced sills, excepting draw sills, which are done in a workmanlike manner, if the indications are that the work has not been recently done, even if the splice does come nearer than 12 inches of the bolster. This opinion is given for the instruction of car inspectors, and not for the government of car repairers. In the repairs of cars Rule 12 must be adhered to.

A lengthy discussion then ensued on the subject of passing cars with defects which do not render the car unsafe to run, the prevailing sentiment of the meeting being that cards were not used frequently enough, and that freight was unnecessarily detained at interchange points, which should go forward with cards provided the cars could be safely run.

Mr. Marden called attention to the large number of cars in service with defective brake-wheels, endangering the lives of trainmen. It was decided that the rules, if lived up to, would remedy this evil.

Attention was called to Rule 17, relating to running repairs upon cars belonging to private parties. Inquiries were made by several members as to who is responsible for the renewal of brasses, and for all repairs made on cars belonging to such parties or to private corporations. The discussion showed that a diversity of practice existed, some roads treating private cars the same as those belonging to foreign roads, while others charged all repairs to the owners of the cars.

The unanimous opinion of all present was, that private corporations and owners of private cars should pay for all repairs, including the maintenance of brasses. It was decided to put Rule 17 rigidly in force on and after August 1 of this year.

The meeting adjourned to meet at the Tifft House, Buffalo, Sept. 15.

Tests of Freight-Train Brakes.

The following are the results of tests of the American Brake Company's system of brakes, made on the Hackensack grade of the New York, West Shore & Buffalo road, Aug. 14 and 15: and also on the Lehigh Valley road between Metuchen and Phillipsburg, Aug. 17. The West Shore tests were made on trains with steam driver and tender brake, twelve coal cars and two box cars with automatic freight-car brake, and two cars without automatic brake. Length of train 582 feet, weight of train (Aug. 14) 358 tons, (Aug. 15) 355 tons.

Stops made on West Shore, Aug. 14:

No.	Speed. Miles per hr.	Time. Seconds.	Distance. Feet.	Grade. Ft. to mile.
1	21	25	374	Level
2	25	37	666	26 4 d.
3	25	45	878	52.8 d.
4	25	50	953	47.52 d.
5	25	39	618	Level
6	20	27	360	21.12 d.
7	20	28	473	Level
8	20	38	623	52 8 d.
9	20	36	619	47.52 d.
10	20	20	319	Level
11	30	33	713	"
12	26	47	974	36 96 d.

Stops made on West Shore, Aug. 15:

1	20	23	348	Level
2	25	35	637	26.4 d.
3	25	46	909	52.80 d
4	25	48	918	47.52 d.
5	25	28	505	Level
6	25	38	688	21.12 d.
7	25	30	532	Level
8	20	25	362	21.12 d.
9	20	24	350	Level
10	22½	28	440	"
11	25½	44	840	36.96 d.

Stops made on Lehigh Valley, Aug. 17: Train same as above except one additional car without automatic brake. Length of train 619 feet, weight 373 tons.

1	32	39	950	4.5 d.
2	40	48	1,310	"
3	40	48	1,332	"
4	36	33½	862	26 up.
5	40	47	1,379	Level
6	34	33	812	"
7	36½	43	1,173	" *
8	40	58	1,647	22 d.
9	25	25	450	"
10	21½	19	290	"

* 8 cars with, and 9 cars without brakes.

It will be observed that the trials on the West Shore were at the usual freight train speed on that road. The Lehigh Valley tests were mostly at much higher speeds.

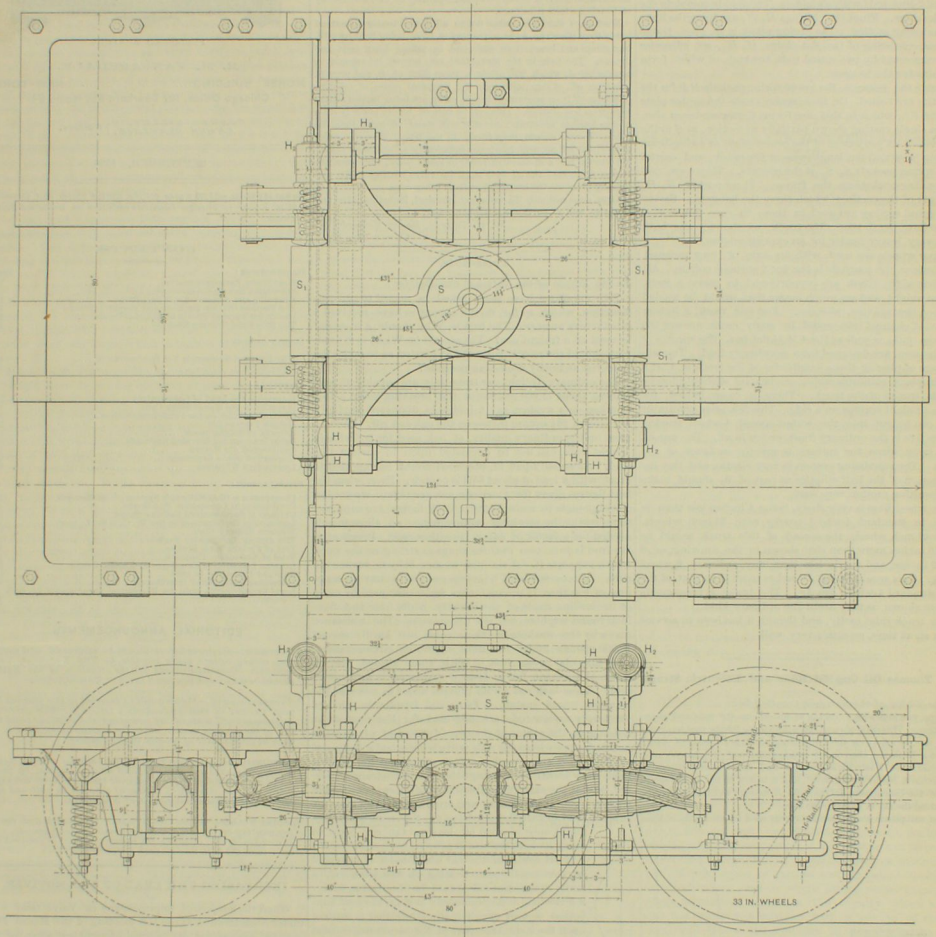
Lagging Locomotive Fire-Boxes and Boiler Heads.

During a recent visit to the excellently managed machine shops of the Lake Shore & Michigan Southern Railway at Buffalo, which are in charge of Mr. J. S. Graham, Master Mechanic, we had the opportunity of examining several locomotives that had the sides and ends of their fire-boxes and the boiler-heads lagged to prevent radiation of heat. Mr. Stevens, Superintendent of Motive Power, explained the method followed in his report to the committee of the Master Mechanics' Association on "Improvement in Locomotives." A sheet of asbestos is placed next to the hot surface, and over that is put a covering of hair felt one inch thick, the whole being kept in place by a sheeting of kalamein or planished iron. Lagging the fire-box and boiler-head has generally been regarded as impracticable although very desirable, for immense loss of heat results from these surfaces being exposed to the chilling currents that strike them when the engine is in motion. The work of lagging these locomotive fire-boxes and boiler-heads has been very skillfully carried out, and the lagging does not interfere with any of the attachments in the least. The expense of doing the work is reported to be small in comparison with the calculated saving that will be the result. Mr. Stevens intends applying this simple means of heat saving to all his engines as they go into the shops for repairs.

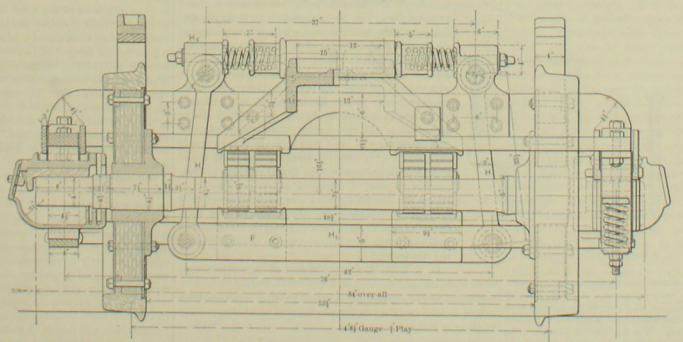
THE Chicago & Northwestern Railway Company have several smoke-consuming locomotives in use, a brick arch and brick deflector being the principal aids to promote the admixture of the gases necessary for perfect combustion and the prevention of smoke. Mr. Tilton and his assistant, Mr. Scott, are interesting themselves in smoke prevention, and it is the intention to make some changes on fire-boxes with the view of supplying air to the surface of the fire.

SIX-WHEEL EQUALIZED TRUCK,

Designed by Alex Mitchell (Supt. Wyoming Div. Lehigh Valley R. R.) and Geo. S. Strong, Philadelphia.



Plan and Side Elevation.



Section and End View.

THIS truck differs in several important points from any other now in use. The elliptic springs in the swing-motion are placed parallel to the rails instead of at right angles to them. Two spirals and two half-elliptics are used for equalizing. There are no equalizing bars in the ordinary sense, their place being taken by a pair of equalizing levers over the top of each box. These are connected to the ends of the half-elliptics by links. The outer ends of the outside pairs are connected to a spiral spring which bears against a pocket on the jaw brace. These levers, which are small and light, are made from ¼-inch plate and are 3½ inches wide.

Those at the ends are 20 inches long, but the central pair is but 16. A continuous iron frame is used. In the drawing it is shown as 4 by 1⅛ inches. This carries a pair of flat safety-beams set a little inside their usual position. The two transoms cross the truck between the wheels and stand above the level of the frame. A pair of

arch bars of the usual form carry the side bearings. Inside of these are two pairs of castings, H_3 H_3, bolted to the transoms. These are connected by a pair of round 2-inch rods with shoulders. These rods complete the truck frame. From the castings H_3 H_3 are hung the links of the swing motion. The spring-plank is an open frame of iron, consisting of two flat plates, H_4 H_4, set edgewise and connected by two round rods, the ends of which form the pins for the hangers.

Inside the hangers, the lower spring pockets P P for the elliptics are bolted. On these springs rests the center-plate casting S S, which in this case forms the swing-beam also. It is a single casting shown partially in section, at S in the end view. A projection of the center-plate or swing-beam casting is carried out lengthwise of the truck, and carries four spring pockets S_1 S_1 at the corners. There are corresponding pockets on the frame. These pockets H_2 H_2 are part of the castings which carry the hangers. Seven-inch spiral springs are used in these to ease the motion and relieve the shocks. The truck, as shown, was built for a very heavy tender for an express engine.

Paper wheels are used, with an axle of very unusual proportions, the journals being 4×8 without collars. All portions of the truck are proportioned to carry a very heavy weight, and are much larger than would be needed even on the heaviest sleepers. For car work, a lighter frame of channel iron would in many cases answer the purpose quite as well as the $4 \times 1\frac{1}{2}$ flat bar. The springs, it will be seen, are designed for a very heavy load. The advantage of placing them lengthwise of the truck is, that a quadruple or quintuple spring can be used without increasing the spread of the truck. There is room, indeed, for seven or eight springs on a side. This is a greater number than can be got into the widest-spread 4-wheel trucks, where five is the ordinary limit, or ten in all. The unusually large space for springs is greatly in favor of the truck. The equalizing system is very elastic, and the introduction of the half-elliptics as part of it, should make the resulting motion very easy.

The wheel base is very short, being 4'inches less than is usual in standard 4-wheel trucks with 33-inch wheels. With 42-inch wheels, the spread of this truck would be but 18 inches more than that shown in the drawing, or 8 feet 2 inches, and much less than any ordinary 6-wheel truck. This would be but 14 inches more than that of the best standard 4-wheel trucks. The brake arrangements are not shown, as they are of the ordinary kind.

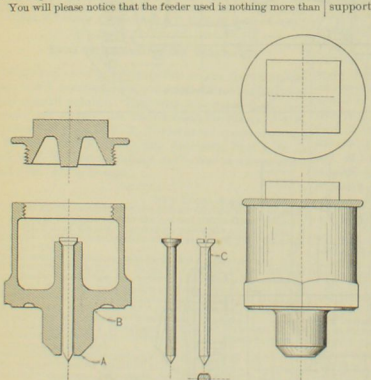
The truck rides easily, and though it has been in service but a short time, promises very well.

The Thomas Oil Cup for Rods and Eccentric Straps.

To the Editor of the National Car-Builder:

I send you herewith a tracing of an oil cup for rods and eccentric straps. This style of cup I have been using for the past ten years with success; first on the Philadelphia & Erie Division of Pennsylvania Railroad, then on low-grade division of Alleghany Valley Railroad, then Nashville & Decatur and Henderson divisions of Louisville & Nashville Railroad, and it is now in use on the entire line of the Chesapeake & Ohio and Kentucky Central railroads, including the E., L. & B. S. Division.

You will please notice that the feeder used is nothing more than a No. 12 screw blank, which can be had of the American Screw Co., Providence, R. I., at 75 cents per gross. All that is necessary is to file off the edge of the head, as shown by the sketch, so as to reduce the area, for when the whole head is allowed to remain the plunger will not act properly. The flat side on plunger is to allow any dirt or sediment that may be in the oil to pass through and prevent the feeder from sticking. The lift (which is about $\frac{1}{32}$ of an inch) is governed by the fit in cup, all of which should be made the same length, so that cups can be interchanged. You will also notice that the threaded end which screws into strap is made conical to prevent the oil from passing out from feeder to thread in strap, then following it down to underside of strap, thence between strap and brasses (more especially when there is lost motion between strap and brasses), thence between strap and stub end, or down along flanges of brasses and then thrown off. By using the cone-shaped end the oil will naturally fall to point A and cling to point of feeder, and consequently be thrown directly on bearing where it belongs.



Much care should be taken not to allow the feeder to extend lower than the strap, so as to prevent it from being bent by pulling strap and brass from stub end in taking down rods and brasses. The hole in the strap that cup screws into should be counterbored, which will allow a large fillet at B, and prevent breaking off of cup; although the principal cause of oil cups breaking off is on account of hole in strap not being tapped square to face on top of strap. This can be noticed before lower portion of cup touches the strap; one side will stand off more than the other. Feeder should play freely in the hole. This cup, when properly fitted up, will lubricate sufficiently an ordinary crank-pin journal for a distance of 1,200 to 1,500 miles, and when the engine is at rest the oil feed stops by valve seating itself, and thereby prevents the loss of oil as from other cups.

These cups cost only 35 cents each, finished, including labor and material, and all parts are interchangeable.

W. H. THOMAS, Master Mechanic,
Ches. & Ohio Ry.

Truss-Rods.

To the Editor of the National Car-Builder:

Two questions have been asked in regard to car construction, which, so far, do not appear to have received a satisfactory answer. The first is, Why should a truss-rod be used on a freight car? The second is, When it is used, why should the needle-beams be so located as to make the truss-rod as nearly useless as possible?

The ordinary freight-car truss-rods are capable of sustaining about 75,000 pounds at the breaking point. This is taken on a washer, say 6 inches in diameter, having a net area of 26½ square inches on the oak end sill. Such an area, on the ordinary quality of oak used for end sills in freight cars, can not be depended upon to sustain this load. As usually put in, the wood might be expected to crush with a load of about 35,333 pounds. Even when the best figures given for American oak are taken, we get but 53,000 pounds to resist 75,000. Both figures are supposed to represent the breaking strains, hence no allowance is needed for a factor of safety in either case. Practically, the iron is from two to three times as strong as the wood which supports it. A six-inch washer is by no means the rule. Square washers, 3 inches on a side, having a net area of less than 7¼ square inches, have been used by some of the leading roads of the country, while four and five-inch round washers are not uncommon. The resistance given by the washers in these cases can hardly exceed 10,000 pounds under the most favorable circumstances, and may be even less. With such absurd proportions, the reason for a 1¼-inch truss-rod is difficult to find. A one-inch rod would provide about as much as the washers would sustain. Two, and frequently four, of these very useless rods are provided for the purpose of holding up the center of the car. Instead of placing the needle-beams where the rods will give the body the most support, they are spread six feet apart and the saddles made very short. This brings the greatest strain on the rod, and at the same time gives very little support to the center. The needle-beams and truss-rod saddles give no support, and in case the car drops on the road-bed, they are at once cleaned off, leaving the car body to carry its load the best it can.

If the center of the car could have the support of the needle-beam resting on the truss-rod, a really substantial aid would be obtained in carrying the load. As commonly put in, the load supported is only one-fifth the strain that is thrown upon the rod. One part of the structure is four times as strong as it need be, while the washers, manifestly the weakest point, are at such a disadvantage that they are subjected to a strain five times greater than the load which is producing the strain. The advantages of a central needle-beam have been demonstrated in more than one instance. The figures are not at hand, but the gain is a very large one. In practice, the truss-rod becomes actually more useless than it is in theory. With contract work, and even in railway shops, green oak is the rule rather than the exception. The shrinkage of the end sills is consequently excessive; this relieves the washers and truss-rods, which are commonly found so loose in their saddles as not to occasion remark. Truss-rods which are not doing work are to be found in the majority in freight cars. On passenger cars it is by no means an un-heard-of thing to find that the rods are doing no work at all, but only increasing the dead weight.

It is held by many builders of experience, that truss-rods are not needed in a well-built freight car. Unless some better method is found of putting them in, they might as well be lying in the stock room as adding weight to the car body.

MAX.

ON Saturday, August 8, the dayof Gen. Grant's funeral, the New York elevated roads carried a total aggregate of 400,076 passengers. On the day of the opening of the East River Bridge, 389,501 were carried. These are the two heaviest days' traffic since the lines were opened.

NATIONAL CAR BUILDER

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EDITORIAL ANNOUNCEMENTS.

Addresses.—*Business letters should be addressed, and drafts and money orders made payable, to* THE NATIONAL CAR-BUILDER. *Communications for the attention of the Editor should be addressed* EDITOR NATIONAL CAR-BUILDER.

Advertisements.—*Nothing will be inserted in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *The editorial department will contain our own views and opinions; and the rest of the reading matter, aside from advertisements, will be such as we consider of interest to our readers.*

Contributions.—*Articles relating to railway rolling stock, construction and management, and kindred topics, by those who are practically acquainted with these subjects, are especially desired. Also early notices of changes in railroad officers, organizations and names of companies.*

Special Notice.—*As the* CAR-BUILDER *is printed and ready for mailing on the last day of the month, advertisements, correspondence, etc., intended for insertion, must be received not later than the 25th day of each month.*

INCREASING THE LEAD OF LOCOMOTIVES.

When the subject of Improvement in Valve Gear was under consideration at the last meeting of the Master Mechanics' Association, Mr. Setchel brought out what we regard as a very important discussion, by asking whether or not the members of the Association generally regarded the increase of lead given by the link motion as being detrimental to the working of a high speed locomotive? The report on the subject of improvements in valve gear consisted principally of extracts from letters received from American and foreign master mechanics and superintendents of motive power. Several of the latter adverted to the increase of lead where the shifting link was employed, as a recognized evil, and described the means they had followed to obtain constant lead. A point of merit claimed for the Joy motion was that the lead is constant at all points of cutoff.

The American master mechanics were not disposed to admit that constant lead was an advantage, or desirable in any way for high speed locomotives. A great many of the members took part in the discussion, and most of them speaking from personal experience, gave reason for favoring the link, which increases the lead at the time early release and early compression are desirable. With a slow running locomotive, where the steam is admitted, say, during half the stroke, very little lead is necessary, for with ordinary engines the exhaust will occur early enough to prevent back pressure during the return stroke; and compression will begin in sufficient time to provide the cushion required to bring the cranks smoothly over the centers, to reheat the cylinder and to raise the pressure in the clearance spaces to the initial steam pressure. An arrangement of the valve motion that is an advantage to a slow running locomotive, will also prove beneficial to a high speed locomotive at the period when the latter is doing the slow work of getting the train away

from a stopping point, or of pulling hard on a long hill. High speed locomotives provided with valve gear that keeps the lead constant at all points of cutoff always require to have the valves set with what would be regarded as excessive lead at full gear in a shifting-link engine. In fact, to get engines of that kind to do their work properly, it is generally necessary to give them nearly as much constant lead as a well designed shifting-link engine reaches when hooked up to cut off at eight inches. This excessive lead must be detrimental to the working of the engine when pulling on grades or at places where the steam has to be worked half-stroke. There are so few engines at work in this country with constant lead, that it is a difficult matter getting an opportunity of making the indicator tests that would show the truth of our assertion; but we are satisfied if any engineer will make the tests that he will find our position correct.

The burden of testimony given by master mechanics who had had experience with engines having constant lead was, that they could not make running time on fast trains. This appeared a little paradoxical at first, considering the fact that constant lead is the prevailing motion used in Britain, where the fastest trains in the world are run. But Mr. W. H. Thomas, of the Chesapeake & Ohio road, offered a very plausible explanation. He reminded the members that although trains were run fast where motion with constant lead was in use, the driving wheels were very large, which admitted of a slow piston speed.

The necessity for magnified lead and early compression is no doubt more dependent upon the number of revolutions made per minute than upon the velocity of train progression A common driving wheel diameter of high speed British locomotives is 7 feet. An engine with this size of wheels makes 160 revolutions per minute when running at a speed of 40 miles an hour. The most common size of driving wheels used on American passenger locomotives is 5 feet diameter. While running at 40 miles an hour, an engine of that kind makes 223 revolutions per minute. With a stroke of two feet, the average piston speed of the former locomotive is 640 per minute, while the piston speed of the latter is 892 feet per minute. As the piston must stop twice during each revolution, the large wheel entails 7.33 stops per second, and the small wheel 7.43 stops per second. The work stored in the piston and its attachments at the period of its highest velocity, or at the time the crank-pin is passing the quarter, is very great, and is proportionately greater in the engine with the small wheel than in that with the large one. The maximum velocity of the latter will be 1,070 feet per minute, and of the former 1,408 feet per minute. The work stored in the inertia of the piston must be calculated for the moment it has attained its maximum velocity. A speed of 1,408 feet per minute is 23.4 feet per second. Reckoning the weight of the piston to be 500 pounds, we have $\frac{500 \times 23.4^2}{64.3} = 4,180$ foot pounds. This quantity of foot pounds is accumulated and expended twice during each stroke, or 446 times per minute, and amounts to $\frac{4,180 \times 446}{33,000} = 56$ horse-power. The engine with the large wheel and comparatively slow moving piston, has to control much less piston inertia power. The highest speed is 1,076 feet per minute, or 17.6 feet per second. Figured by the same rule as the other, this represents 23 horse-power. These figures indicate that the small wheeled American engine has not only to make its strokes much oftener than a large wheeled engine, but it has to reduce the speed of the reciprocating parts from a much greater velocity; therefore greater compression is required to transfer part of the work represented by the piston momentum over to the succeeding stroke. With the restricted port opening inseparable from the use of the link motion, there would be a very sudden fall of pressure in the cylinder as the piston springs away from the head at the beginning of the stroke, unless lead provides ample opening for early steam admission. Whether or not the small wheeled locomotive is an economical motor for pulling a high speed train may be an open question, but few men who have handled such engines, will doubt the wisdom of providing them with a motion that increases lead and compression at the time fast running is required.

ELECTRIC LIGHTING ON CARS AND LOCOMOTIVES.

Electric lighting continues to progress slowly in its application to various departments of railroad equipment. The Pennsylvania Railroad Company continue to run a train between Altoona and Pittsburgh, lighted by electricity supplied by storage batteries that are charged by dynamos run in the machine shops at Altoona. The system is more expensive than gas, but it is considered a more desirable light, and if it proves perfectly reliable as worked under the system on trial, it will receive extended application by the company.

The Great Northern Railway, of England, has recently been running a train lighted by electricity, which is also supplied from storage batteries carried on the train, but with the difference that the batteries are being constantly charged by dynamo machines driven from the axles of the cars. This is also an experimental train, but the work has been done in a way that promises permanent success.

The Lehigh Valley Railroad Company are reported to have contracted for the equipment of all their passenger locomotives with electric head-lights, subject to their ful filling certain conditions to be decided by tests. One engine has been running with the light, and its brilliancy attracted great attention, but its use has for the present been discontinued owing to objections raised by the Pennsylvania Railroad Company, over whose line the Lehigh Valley trains run into Jersey City. The electricity that supplies the light to this head-light is generated by a dynamo run by a small rotary engine, the machine being fastened to the running-board. The wires are insulated with rubber, and it is the intention to place them inside the hand-rail, where they would be beyond the danger of contact with any thing that might lead to an accident. The light itself is 2,000 candle-power. It swings on pivots, and the points are kept to their places by a special form of electric feed which is said to prevent flickering.

Many electricians have for years been striving to produce a successful electric head-light, but it has generally been found that the jars and vibration of the engine while running soon destroyed the delicate apparatus that regulates the light. The first success in overcoming this difficulty was achieved by Mr. Sedlaczek, an Austrian telegraph officer. In 1881, after five years of incessant labor, he succeeded in obtaining a good, steady light that was not disturbed by the vibration. He employed a Gramme dynamo driven direct by a Brotherhood motor, which was run at from 700 to 800 revolutions per minute, and was controlled by an automatic regulator. To sustain the light, required the expenditure of between three and four horse-power.

RETURNS OF ROLLING STOCK.

The figures in Poor's Manual of last year show an increase of rolling stock on all the roads in 1883, of 1,709 locomotives, 2,348 passenger cars, 582 baggage, mail and express cars, and 38,210 freight cars; while the figures in the Manual of this year show an increase in 1884, of 764 locomotives, 94 passenger cars and 49,738 freight cars, and a decrease of 37 baggage, mail and express cars. This is a comparative decrease in 1884, of 945 locomotives, 2,348 passenger cars, 545 baggage, mail and express cars, and an increase of 1,528 freight cars. Under all the circumstances, no very great degree of accuracy can be expected in the returns of rolling stock upon which these figures are based. In view of the fact that a vast number of freight cars have been reported as standing idle for many months past, it is hardly credible that nearly 50,000 new freight cars were added to the equipment in 1884, exclusive of the new ones required to replace those that have been worn out or destroyed, and also in view of the statement in the Manual that the tons of freight transported in 1884 were 10,378,690 less than in 1883. That the passenger equipment should have been increased during the year less than a hundred cars is very probable, and it may be that 764 new locomotives were put in service, which is considerably less than half the increased number reported for 1883.

DIVERSITY IN THE SIZE OF STOCK CARS.

For some time past there has been a great deal of trouble among Northwestern roads about the carrying of live stock. There is disagreement among the various roads about the share each company receives of this business, and there is want of harmony about the running of the trains. At present each road makes such time as it chooses, some running faster trains than others, which causes some heartburning. It is found impossible to induce the roads to come to an agreement about this matter of speed; and the action of some of the roads in equipping stock cars with the air brake, that the trains may be run on passenger train time, may even result in the cutting of rates by the roads which are afraid of getting left. Another curious complication about this conflicting business is the size of cars. The stock cars belonging to the various roads are very diverse in size, varying in length from 26 to 34 feet. As the freight for live stock is based on the car load, and a large car can take more steers than a small one, the shippers display a persistent preference for owning the largest cars, and no amount of argument will convince them that they ought to divide their patronage evenly among the competing roads. Under these circumstances it is not surprising that some of the competing roads are making all their new stock cars "moguls," as the largest size is called. If business is conducted long in the way it is going at present, there will be remarkable activity pretty soon in the building of stock cars.

This system of transporting stock by the car load, irrespective of the carrying capacity of the car, is entirely wrong, and all the roads concerned are interested in having the practice changed. Efforts ought to be made to have live stock carried by weight, or according to the amount of room provided. Neither plan would present insuperable difficulties, and either would effect an approach to a just and equitable way of doing business. An agreement might easily be arrived at about charging rates according to the capacity of the car, or it would be even better to charge for weight of stock. Good weighing scales are so abundant that there ought to be no difficulty in weighing the animals before they enter or after they leave a car. Unless a settlement is reached on some common-sense basis of this kind, the cause of the disputes is going to increase. The movement toward increasing the capacity of cars is a silly, willful agreement to change the rolling stock for the purpose of aiding in a covert reduction of rates. It will avail nothing in the way of bringing about uniformity, for those who first came out with the 34 feet cars will not hesitate in again increasing the size if it will enable them to overreach their competitors for a season.

CABLE TRACTION FOR ELEVATED RAILROADS.

The article of Angus Sinclair on the Work of Operating Elevated Railroad Trains, which was published in our July number, has elicited quite a good deal of discussion in the technical press and among railroad mechanical men. The general opinion appears to be that the experiments gave a correct estimate as to the amount of work that had to be done In several instances exception is taken to some parts of the article, but the general conclusions are not disputed. The *Street Railway Journal* thinks, assuming the figures to be correct, "that there is ample reason for looking into the cable system for the shackly elevated railroads of New York." We do not think such a change advisable. An indispensable requirement of a railroad performing traffic of the kind done by suburban and elevated roads is punctuality in the running of trains. The public will insist that trains of this kind shall be operated in the manner that provides the most regular service. To operate the New York elevated roads by cable traction, it would be necessary to keep the cables running at the maximum speed of the trains, which is about thirty miles an hour. Engineers connected with existing cable roads, where the speed is about ten miles an hour, say that it would be impracticable to operate trains with a cable running thirty miles an hour, or that the wear and tear would be enormous. Where cable traction is used, even with the low speed employed, breakages that cause several hours' stoppage of the cable are by no means uncommon. The city of New York would be in a great tumult if the Elevated Railroad Company were operating the Third Avenue line by cable, and a break occurred at 4 o'clock P. M., that could not be repaired in less than three hours. There are numerous other objections to cable traction for rapid suburban transit, but as there is no probability of the system being applied to moderately high-speed trains, there is no use in discussing it.

MAKING FIGURES LIE.

Unless it be among men of an extravagantly skeptical turn of mind, the axiom that figures can not lie is received as an infallible truth worthy to rank with demonstrated mathematical facts. Yet it is amazing to reflect how frequently the veracious figures that record the results of accurate mechanical experiments are made to parallel the audacity of Munchausen literature. In all departments of mechanical work devices are constantly being offered for application that are guaranteed to save all the way from five to fifty per cent., and when a test is made, the inventor generally demonstrates that his claims can be proved. Railroads are regarded as a particularly promising field for the operations of parties owning patent appliances designed to save money where saving seems impossible. There is scarcely a road in the country where a man can not succeed in proving that a saving of ten per cent. will follow the adoption of any device he may have for sale, if he goes about the business in the proper manner. This is how so many trials have been made of patent valves, grate bars, spark arresters, smoke consumers and other attachments of locomotives, and how so little good has resulted from the use of appliances that promised so much. An inventor or his agent goes to a master mechanic and talks up the merits of his device. Master mechanics are not generally zealous to try patented devices, and the agent goes to a friend who has some influence with the management and gets an order to have the device tried entirely on its merits. It is placed on an engine that has been running on a certain train where there are good means of showing the coal used before and after the test. Before this device was put on, the engineer and fireman worked away in an apathetic manner, not wasteful nor careful about the way the engine was worked. But when the new device is put on, they are placed upon their best behavior, and the engine is worked to the very best advantage, so that there is no difficulty about making an apparent saving of ten per cent. On an Eastern railroad, where a very careful record of the fuel consumed is kept, and which is required to try many new devices, it is well known that during the continuance of recorded tests a saving of from ten to twenty per cent. of fuel will result. It makes little difference what the device may be. One month it may be a smoke consumer; next month, an electric signal. Both will have about the same effect upon the coal pile; but the officers of the road know how it is produced, and what the result would be if the appliance were adopted as a permanent attachment to the locomotive.

All roads are not situated so that the officers can tell

just how the apparent saving comes round, and many appliances that have afterward proved worthless, have been practically forced upon mechanical departments through the unreliable figures gotten as a result of comparative tests of the kind described. There is, of course, something radically wrong in methods of operating that will admit of apparent saving when special inducements arise for working economically. If a man can save ten per cent. of his coal or other supplies under inducements to work economically, he ought to be caused to keep up the effort which produces the best results. The premium system of coal-using inaugurated on some divisions of the Pennsylvania Railroad Company's lines, is said to have produced remarkable results in the way of fuel saving. Although considerable outlay is required to put the system in operation, it is doubtful if any improvement applied to railroad operating of late years, has paid so well. From what we have seen of the system at work, we feel assured that putting in a new spark arrester or other patented device, would not make any perceptible difference in the coal consumption of these engines, unless there were real merit in the article; for the men are already doing their best to work cheaply. The leading merit of the coal premium system is, that its stimulating impetus to make a good economical record never relaxes. Fuel accounts are kept so loosely on many roads that actually no check exists upon the men who are habitually wasting coal. Where no check exists on the evil-doer, the man who labors to make a good record receives no credit for his efforts. Consequently, the tendency is to make all enginemen indifferent about the quantity of coal they use, their only care being to get over the road comfortably with their trains. It is human nature for men to feel that way, and enginemen are really not so much to blame as the higher officers who keep to chaotic methods that have a demoralizing tendency.

UNGUARDED GRADE CROSSINGS.

Accidents at grade crossings are so common that they excite little public attention even when the results are most horrible and sickening, and the lack of the means of prevention the most inexcusable and flagrant. The one which occurred near Summit, N. J., on the 4th of August, was more heart-rending in its fatality than this class of accidents usually are, resulting as it did in the death of three women and an infant, the severe injury of another woman and child, and indirectly in the death of one man. To recite the details would be merely a repetition of the old threadbare story—an ungarded highway crossing; train close at hand, on time, and running fast; freight cars on a siding preventing engineer from seeing a carriage on the crossing full of women and children, until he was within fifty feet of it; collision unavoidable; mangled bodies and limbs; instant death of two of the victims, and lingering torture and death of two others.

It would perhaps be unfair to single out the road upon which this terrible destruction of human life occurred as being more culpable than scores of other roads with crossings equally unguarded and dangerous, but which from sheer luck have not had accidents of this kind every week or month. The usual warning to "Look out for the Locomotive," is not sufficient to shield a road from responsibility and transfer it to the victims who failed to heed the sign, bell, or whistle. The safety of women and children, or of any body, in fact, who has occasion to drive a vehicle across a track, should not be left to their own prudence. They should be protected against their own lack of judgment, and in such a way as to make collisions at crossings next to impossible. In Europe this is done very effectively by having, with rare exceptions, no level crossings at all, and in every exceptional case they are constantly guarded. In this country these level crossings are the rule, and a great many of them in towns and cities where the street traffic is large and trains numerous, are so extremely dangerous as to excite the surprise of foreigners. As examples, we may cite certain crossings in Newark and Elizabeth, N. J., as they were a few years ago, when accidents were of almost daily occurrence, but which have been almost entirely prevented by means of gates and vigilant flagmen. A mere signal can not prevent any one from driving on a track if he is disposed to do so. A flagman must stop him, or a barrier of some kind must be interposed to keep him off.

The indifference of the public and of railroad companies to the exposed condition of the tracks of steam roads almost every where, and especially in many large towns, is something almost phenomenal, and can only be accounted for on the theory that it has always been so, and every body has got used to it. Were statistics of this class of accidents attainable with any approach to accuracy, even railroad men would be startled at the large number of deaths and personal injuries that result therefrom. With limited capital, and long lines to construct, we have been too eager in the past to realize the advantages as quickly and as cheaply as possible without giving due attention to the necessary safeguards for the protection of human life. The interests of railroad companies themselves would seem to be a sufficient incentive to guard against these accidents in every practicable way, but the responsibility for the neglect which has hitherto prevailed rests primarily with the law-making power, in its failure to enforce the use of the proper means of prevention. Some ten years ago, the subject of highway grade crossings was brought to the attention of the Legislatures of New York and Massachusetts, and more recently of Connecticut, but so far as we remember, without the enactment of any very effective legal regulations for mitigating the evil.

THE CAR COUPLER PROBLEM.

The circular of the Executive Committee of the Car-Builders' Association relating to a trial of car couplers, which appeared in our August issue, was received barely in time for insertion without editorial comment. We now republish the circular with some changes subsequently made in it by the committee, and to which we are requested to call the attention of our readers.

In view of the inaction of the committee last year, in disregard of the instructions of the Association to issue a circular setting forth a plan for making tests and raising money to defray expenses, their prompt action under the resolution adopted this year at the annual Convention at Fortress Monroe is worthy of commendation. The committee are empowered by this resoluion to make a public trial of couplers, employ experts and solicit the co-operation of railroads in the work. The trial will be made at Buffalo, N. Y., Sept. 15, under certain prescribed conditions which are highly practical, and can hardly fail to result in the selection of such limited number of couplers as shall prove most satisfactory in their performance. The couplers so selected will then be recommended to the railroad companies for further tests in actual service, such tests to be continued until next May, when the committee will prepare a report, and may recommend one or more automatic freight car couplers for universal adoption.

This looks like business; although the committee do not commit themselves positively, inasmuch as they can not know beforehand whether the trials at Buffalo or afterward on the roads, will develop any devices worthy of universal adoption. If the committee shall decide to make no recommendations when next June comes round, they will doubtless give some very satisfactory reasons therefor. It must be admitted that the difficulties in the way of a square and positive recommendation of "one or more freight car couplers" are very great, but it is no small matter to get the problem into its present shape by the weeding-out process which has been going on in one way or another since the Legislatures of certain States began to take action on the subject a year and a half ago. Legislators and railroad commissioners very naturally attach great weight to any discrimination made by the Car Builders' Association as to the merits of couplers, the members of which are supposed to know more about them than any body else, and to be capable, therefore, as practical experts, of indicating what legislation, if any, is expedient for the protection of the men who handle and couple cars.

TESTING THE PROPOSED STANDARD FREIGHT-CAR TRUCK.

We are informed that Mr. G. W. Rhodes, Superintendent of Motive Power of the Chicago, Burlington & Quincy road, has, with the approval of the management of the road, addressed to each master mechanic under his supervision a letter in regard to making some tests with the standard truck recommended by the committee of the Master Car-Builders' Association. The letter directs each master mechanic to make a requisition for a set of the new trucks, and says: "This is a new design submitted by the M. C. B. truck committee at the last annual convention. The Association, before adopting it, recommended that the members get some of the proposed trucks built and put in actual service, in order to report results at the next annual convention. Get these trucks into service as soon as possible, and carefully watch their running, especially in regard to repairs, and make me a full report in the course of seven or eight months. Put the trucks under an engine tank subject to severe freight service. The trucks have been ordered built on a general account requisition, in order that we may have their cost accurately."

This is a most timely action for which the management deserve the thanks of every railroad company interested in the adoption of standards, and we trust others will follow the good example and have trucks of the pattern recommended built and put in service long enough to demonstrate their general utility before the next annual meeting of the Association.

LOCOMOTIVE WHISTLING.

We are not surprised at the recent action on the part of the citizens of Lawrence, Mass., in petitioning the railroad commissioners of that State to curtail the unrestricted use of the locomotive whistle within the city limits. One of the commissioners is a practical locomotive engineer, and he is almost certain to favor the cause of the citizens, for he must know from personal experience that the greater part of whistling done by engineers is unnecessary and in many cases pernicious. The laws of the several States are to blame for the great amount of whistling that is going on all over the country. The statutes of many States require the locomotive whistle to be sounded at a great many places, and the men get into the way of thinking that the oftener they whistle the more conscientiously they are doing their duty. In early railroad days, when the train was not under control of the engineer, frequent use of the whistle was a necessity, but the inventions that have given the engineer power to stop the train at will, have changed all this. It is doubtful if to-day, the locomotive whistle is not the direct cause of more serious accidents to life and property than are balanced by saving from its use, and it is certainly the cause of much discomfort and suffering to invalids and nervous persons. Some engineers get utterly demoralized in the way they handle the whistle lever. The louder they can make the whistle scream the better pleased they are, and repeat the operation the oftener and keep the yell up the longer. American citizens are most patient and long-suffering of abuses that are carried on under the protection of law, and in no instance have they exhibited their extraordinary forbearance so much, as in doing nothing to suppress the whistling nuisance.

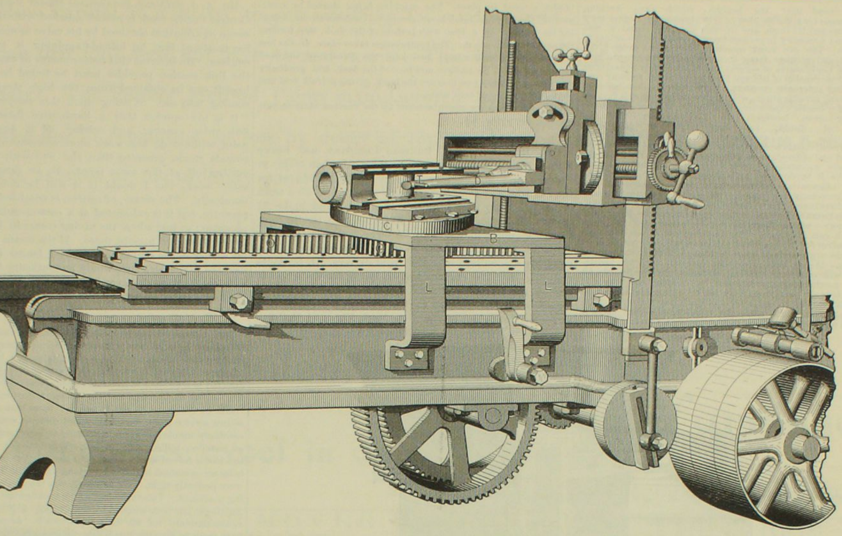
COMPRESSED AIR MOTORS.

We regret to learn that the Steinway Piano Company, which have been using compressed air to run their street cars on the Astoria Street Railroad, have not found that an economical power, and have determined to abandon its use. There is something curious in the history of applying compressed air to locomotive purposes. For the last twenty years, the particulars of highly successful tests of motors using compressed air have been published, plain calculations have been made demonstrating that this method of applying power was certain to put horses off street railroads and steam locomotives off surface roads. There is no arguing against the figures, but somehow when the air motors go into actual service, they are soon taken off for the purpose of perfecting a few details, and they remain off. Within a week we have read particulars of most successful experiments being made in London and Liverpool with compressed air motors that operated tramways over very heavy gradients, and did the work much better than horses. When we read the same story fifteen years ago, we saw in the near future the tortured horse relieved from the killing toil of street-car hauling, and neat, clean air motors doing the work far more satisfactorily for all concerned. But these visions rise no more at the mention of a compressed air locomotive. We hope the parties interested will succeed in a line where an improvement is so very desirable, but the road they are traveling is so badly obstructed by wrecks of former promising enterprises that we cease to be sanguine of success for that department of ingenuity and industry.

THE description on another page of the Chesapeake & Ohio Railway system of keeping car-equipment records, written by Mr. G. W. Ettenger, gives a very clear and comprehensive view of an excellently worked out system. The history of car No. 1,381 is quite characteristic of the vicissitudes of car experience, and will be read with interest by every one connected with car management. The realistic way in which the mutations of the car is related will make the system more easily understood than by a very elaborate description given in an abstract form.

THE number of trains arriving and departing at the Grand Central Depot, in New York, on the day of General Grant's funeral, was greater than ever before in the same number of consecutive hours. Including the numerous special trains for the accommodation of military and civic bodies, and the regular trains that went out in two sections, the whole number of trains arriving and departing during the day could not have been far from 1,200. The fact that they were all moved in safety and without mishap is highly creditable to the local management, but more especially should it be noted as an extraordinary test of the successful working of the Saxby & Farmer automatic interlocking switch and signal system, introduced at this important terminus some two years ago by the Union Switch & Signal Co., of Pittsburgh. The clumsy system previously in use required the services of forty men to work the switches and signals of the intricate network of tracks that form the terminus of three roads, while the increased service is now performed with far greater safety and effectiveness by two men operating a series of levers in the second story of a switch-house situated between the main tracks a short distance from the station building.

MR. HENRY SCHLACKS, Superintendent of Machinery of the Illinois Central road, is building four new passenger locomotives at the company's shops in Chicago, and he is having four more built in Southern shops of the road. The engines have cylinders 17 × 24 inches, and the driving-wheels are 66 inches diameter. They have got steel boilers 52 inches in diameter at the smallest ring, and they have 175 tubes 2 inches outside diameter. The fire-box is 72 inch-s long, and has an arched crown which is secured to the outside shell by radial stays. Two rows of hollow stay-bolts are provided at a point which will be about the upper part of the fire. The engines have extension front ends, and are provided with all the most approved appliances for convenient and economical operating.



DEVICE FOR TURNING PINS IN SOLID CROSS-HEADS.

THE device which we illustrate is one used in the Baltimore & Ohio shops at Mount Clare for turning off pins in solid cross heads. The cross head is a single steel casting with the pin cast in place and the two sides joined by the boss which takes the end of the piston rod. The illustration shows a cross head in place in its chuck and the tool at work. A revolving chuck *C* is mounted on the table *B*, that is supported by four legs *L L*, which are bolted to the bed plate of a planer. The spindle on which the chuck revolves carries on its lower end a gear wheel *G*, that meshes into the rack *O*. This rack is bolted to the table of the planer, and as the table moves back and forward it revolves the chuck and with it the cross head. The work is centered as for turning or any similar work. The cut is taken by the tool *T*, which is a cutter driven through the end of a long bar *D*. This bar is held in the tool post of the planer in the usual way, and is fed downward at every stroke made by the planer. When in operation the planer is set so that the work does not make a full revolution but turns just far enough so that the tool clears the boss for piston rod.

The casting being a single piece, the two sides joined by the boss for the piston rod, it is out of the question to finish the pin by any of the usual methods on account of the lack of space between the pin and back of the cross head. The ordinary arrangements for turning pins require much more room than could be got in these castings. This arrangement was devised by Mr. J. B. Hodgson for many years the foreman of the B. & O. shops, and has been in use for some ten or twelve years with much satisfaction It reduced the cost of finishing these pins very greatly, and at the same time improved the quality of the work. When not in use the legs or supports come off and the table with its gear wheel is lifted to one side and the rack taken off. When thus dismounted the planer is free for any other work.

Legal Requirements upon the Mechanical Departments of Railways.

[Paper read before the Master Mechanics' Association by Mr. Willard A. Smith, of Chicago.]

Recent legislation and decisions of the courts have made manifest an increasing disposition, on the part of the makers and interpreters of the law, to hold railway companies responsible for a high degree of perfection, not only in their methods of operation, but also in the machinery which they employ. On the subject of this legal responsibility, there seems to be in the public mind considerable misinformation; and on the part of railway officials, to some extent, a lack of definite knowledge. It is true that questions arising under this head are of such varying natures and influenced by so many circumstances of fact, that it is difficult, often, to determine just what the result of a suit for damages, in which it is involved, will be. It is also true that, when a case actually arises, it must be left to the legal department of the road to handle. But, as prevention is better than cure, and the results of ignorance and negligence are altogether out of proportion to the amount of labor and care required to avoid them, it is certainly desirable that the officer in charge of the mechanical department of a road should understand clearly the relations in which it stands to the law.

It is the intention of this paper to present briefly and without legal technicalities the principles of the law on this subject as they exist to-day; and something of the future tendency.

It is not uncommon for an inventor or the promoter of a new invention to say: "The law will force railway companies to use my device; even if there is no special legislation for it, the courts will hold railway companies responsible for accidents which might have been prevented by its use; and, therefore, they must come to it." This kind of argument is constantly used in the endeavor to induce capital to invest in so-called improvements; and has, no doubt, led to much injudicious investment. At the other extreme are those railway officials who do not recognize the existence of any legal obligation, except that which is directly expressed in statutory law, and forced upon their attention by strict and well-defined penalties.

The common law relating to the responsibility of carriers of merchandise and passengers, antedates the existence of railways. When the stage-coach was superseded by the locomotive, the general principles of the law relating to carriers remained the same, and were only changed so far as necessary in application to conform to the new conditions. The earlier decisions were inclined to hold railways to a higher degree of care than stage lines, because steam was considered a more dangerous servant than the horse; and the greater the risk the greater should the precaution be. In later times, the tendency to require greater care has been due to a recognition on the part of the legislatures and the public of the increasing comparative value of human life.

In the progress of civilization it is not improbable that this tendency will continue to grow until, ultimately, negligence may come to be considered synonymous with crime; and dollars and cents will not balance the scale against humanity. A world which has realized so much from inventive genius, and expects so much from it, will not tolerate any obstruction to its full fruition.

There are two general divisions of injuries for which a railway company may become liable in damages—those to property and those to persons. With relation to goods received for transportation little need be said. Under the common law, the carrier is absolutely the insurer against all loss except from "act of God" (as by lightning), or the public enemy. In modern practice, the carrier limits the liability by special contract contained in the bill of lading; but he cannot avoid liability for his own negligence. The railway company has the strongest possible financial considerations for endeavoring to avoid injury to merchandise. The cases in which it can excuse itself for any loss or injury thereto are comparatively few.

Merchandise delivered to a railway company for transportation is wholly within the control of that company. Not so with passengers; they are endowed with reason and the power of locomotion. These powers they may exercise for their own safety or they may neglect to use to their own injury. A passenger may place himself in a position of danger, notwithstanding the greatest effort of the carrier to prevent him from doing so. Hence he must be held responsible for his own safety as far as it lies within his power; and contributory negligence on his part will relieve the railway company from liability. But, aside from this, the carrier is held to a very high degree of care, not only in the operation of the road, but in the selection or manufacture and care of its machinery and all its appliances. The railway company does not absolutely insure the passengnr; but it does insure him against all risks due to its own neglect.

It is in the interpretation of this word "neglect" that the gist of the matter lies. Various expressions have been used by the courts in defining the degree of care required of a carrier of passengers, and these have passed into the text-books of the law. It is said that the carrier is "held only to the utmost care of a cautious person;" that it is "liable only for want of due care, diligence and skill;" and that it is responsible "only as far as human care and foresight will go." These are general principles requiring further elucidation. The law does not require anything which is physically or morally impossible, nor a degree of perfection which may be ideal, but is not practicable. It considers that the business of a railway is to furnish transportation, and does not require an expenditure and responsibility so great as to make the business impracticable. It also considers the position of a railway and does not require so much in the way of expenditure from a small road with light traffic as it does of a great trunk line. In other words, it follows the dictates of common sense in determining the exact meaning of the word "duty." These limitations, however, are not intended as loop-holes for escaping responsibility, and within these lines a strict account is held. In general terms, it may be said, that a railway company must be abreast of the times. In the construction of its machinery it must, in the first place, exercise the greatest care in the purchase of materials. The most approved tests must be used; and quality must be considered before price. It would doubtless be considered negligence for a railway company to purchase and use a wheel costing only seven or eight dollars, when the best expert testimony was that a good reliable wheel could not possibly be made for less than ten or twelve dollars. Such action would betray a recklessness which no court could excuse. It has been held that axles must be tested by the most approved methods in use; and that a railway company "must apply to boilers of locomotives every test recognized as necessary by experts." And this liability is not avoided by purchasing machinery already made from manufacturers. The negligence of the manufacturer attaches to the railway company buying and using his machinery. Nor will the high reputation of the manufacturer avail the railway company as a defense.

The only exception to these rules is in the case of "latent defects which could neither be guarded against in the process of construction nor discovered by subsequent examination;" and this will be construed in the light of the highest scientific skill. Many defects which were once considered latent can now be discovered; the causes are known and can be guarded against. Such cases will be considered with reference to the "present state of the art"—ignorance of which is no excuse. So, when a machine or vehicle has been put in operation, continual watchfulness is required, and a cautious observance "of all accustomed and known tests for the discovery of their insufficiency, as often as circumstances require." In an interesting case, the tire of a driving wheel had been tested when new; subsequently it was returned and not again tested. It was held that the neglect to make this second test rendered the railway company liable for an injury resulting from the breaking of the tire. The factor of safety must be svfficiently large to cover all the probabilities, if not quite the posisibilities, and no chances must be taken.

We now come to the important question, in how far a railway company is legally bound to adopt new inventions and improvements. The rule governing this subject has its limits; but within those limits it is one of great and growing importance. The courts are more and more inclined to hold carriers to a strict responsibility, and this is being supplemented to a considerable extent by legislative action. Generally speaking, a railway company is under legal obligation to adopt such new inventions and improvements in the construction of its equipment, as will conduce to the safety of travel. This does not, however, cover every possible device, or any which are only theoretical or in the experimental stage. It is not obliged to experiment with everything which looks well, nor to accept the mere experiment and limited experience of others. Nor is it obliged to use any device which might accomplish its object in one direction, but at too great a risk or actual detriment in others. It must keep up—not with the very highest scientific skill, nor the most advanced flight of inventive genius—but with the actual and general mechanical progress of the times. The law requires the adoption and use of such inventions and improvements as are well known and generally approved—as, for instance, continuous power brakes; platforms which prevent telescoping; and many other devices which will readily occur. But there are always a large number of inventions in existence which have not been demonstrated to be successes, and concerning the value of which there may rightly be a difference of opinion. It thus appears that success is the criterion which the law applies; and that it is not to the earlier stages of the history of an invention that it is aided by this principle, but after it has really won practical recognition.

The same principle regarding the adoption of inventions applies to other classes of injuries besides those to passengers. Neglect to use suitable gates at crossings; valves for preventing the noise of escaping steam which frightens horses; spark arresters for the prevention of setting fire to property along the track—will render a company liable, because such injuries are clearly preventible within the limits of reasonable care and expense.

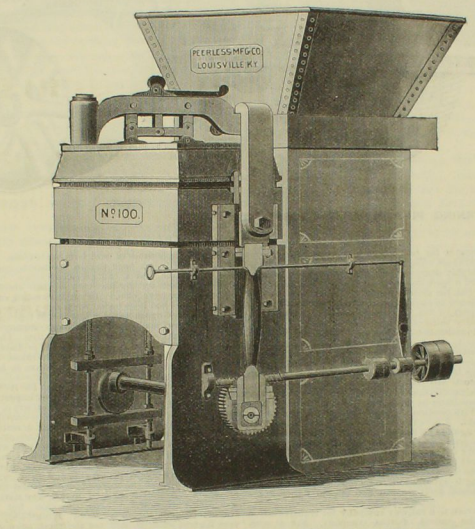
It will readily be seen, from what has been said, that the questions which arise, under our subject, are largely questions of fact as well as of law, and that the amount which a railway company will have to pay in damages in such cases will depend to a considerable extent upon the degree of care, intelligence and foresight exercised by those in charge of its mechanical department.

In many States this principle has been to a certain extent defined by specific legal obligation in the shape of statutes—as, for instance, by a law requiring the use of stoves in which the fire will be automatically extinguished in case of fire. Such statutes do not increase the common law liability; but reduce the question of fact to a simple issue.

The subject of injuries to employés is upon an entirely different basis from those which we have thus far considered. The employé is supposed to understand all the ordinary risks of his employment and to accept them. The employer is supposed to furnish good machinery and improved devices; but is not liable for injuries resulting from defects which were obvious to the employé. If the employé notifies the company of such defects and they are not remedied, it is his duty after a reasonable time to leave the employment. But if he is injured by some defect which is not obvious to him, and which the company should have known and remedied, he can recover. Except where otherwise laid down by statute, the employer is not responsible for an injury to an employé resulting from the negligence of a fellow employe. Questions as to who are fellow employés, and many others involved in these relations, have called forth numerous decisions.

But of late it has become quite general for railway companies to require employés to assume all risk by the contract of employment. The law permits this except in the case of criminal neglect—a thing which is hard to prove. This virtually puts an end to damage suits on the part of employés; and has removed one principal inducement for a railway company to adopt certain classes of improvements. Employés generally are willing to assume the risk, and do not make any decided demand for the adoption of safety appliances. Their reckless disposition has been frequently illustrated. In one State where many brakemen had been killed by overhead bridges, a law was passed requiring the suspension of hanging straps

across the road near the bridges, which gave warning to the brakeman by a slight blow. The brakemen began very soon to be annoyed by them and to cut them off; and it was actually found necessary to protect them by making it a crime to destroy them. The law must sometime step in to protect the improvident and reckless from themselves. Acting upon this principle, the Legislatures of several States have lately passed laws looking to preservation of life and limb by requiring railway companies to adopt automatic couplers. State railway commissioners are also making investigations with a view to urging still further legislation of a similar character. Whether the desired end can be attained or even hastened in this manner may be a matter of doubt. But there can be no doubt that it is due to an existing public sentiment, and that the tendency will continue and increase. It can not be successfully resisted and opposition will only intensify it. Railway officials can only successfully meet it by such enlightened action as shall make it superfluous and altogether unnecessary. The mechanical officers of railways have been engaged in this work of improvement for years, with manifestly great results in certain directions. To a certain extent they have been hindered and embarrassed by the lack of co-operation on the part of those superiors whom financial considerations are the only things which can influence. The requirements of the law may make themselves felt by boards of directors who are not inclined to listen to the arguments of those in charge of their mechanical departments. It may thus prove that properly directed legislative action will overcome existing obstacles and really give an impetus to mechanical improvement, by clearing the way. If this be true it is the part of wisdom not to antagonize the action of our legislators; but to endeavor to direct it into proper channels; and to place in their hands the most complete and reliable information on the topics which they are investigating.



The Rice Sand-Moulding Machine.

THE engraving represents a machine for making moulds for foundry use where large quantities of any one kind of castings are required. The machine is quite simple, every moving part except the templet and follower being shown in the cut, and it can be used by unskilled labor.

The pattern is of metal and does not move, being securely fixed to the bed of the machine. The templet about the pattern or follower as it is called rests solidly on the bed of the machine during compression, the pattern to be moulded extending above it into the sand, the follower itself moulding the face of the flask. By this arrangement under compression the follower and the pattern are virtually one solid piece, and the resulting mould never can vary in depth or thickness, which insures perfectly uniform castings and guarantees a perfect match. The principle involved in the use of an immovable pattern is new and undoubtedly correct, for it works with the same accuracy whether applied to thin or light work such as skillets and stove plates, or to large work like car wheels or oil boxes. It is claimed that one hour's product of the machine equals a day's work of a moulder, and that the machine work is more perfect and gives less percentage of loss.

Its operation is as follows: The pattern is stationary and immovable and rigidly attached to the frame of the machine. The movable box which supports the flask and binder has an up and down movement about the pattern and templet. The bottom of the down stroke, the templet or follower, is exactly on line with the bottom of the flask, the pattern extending above it into the sand. The follower or templet about the pattern rests firmly on the bed of the machine during compression, and after the mould is formed it rises with the flask, supporting the sand while it strips the pattern, then slowly separates from the sand just before the flask reaches the limit of the upward stroke. The cams shown inside the lower part of the machine raise the templet, as described, and with the pitman on the outside constitute the entire moving mechanism of the machine, the stroke made by the cam rods and pitman being nearly equal. The arched binder at the top is thrown to one side to take off and replace the flask, the cover attached to it holding the sand in the flask during compression. In operating the machine it stops automatically at the right distance above the limit of the down stroke; usually about 1½ inches. This leaves the follower the same distance below the top of the movable box, and furnishes the space for the surplus sand that is to be compressed. The flask is then placed on top of the box, filled with sand from the hopper behind the machine by an automatic movement of the sand drawer, and the binder secured in place. The machine being started by movement of the friction clutch lever, completes its down stroke, bringing the follower on a line with bottom of the flask, thus forcing the surplus sand into it. The compression takes place at the line where the movable box and flask join, the density of the sand being greatest at the pattern and face of the flask, and gradually decreasing in density as it nears the back, giving perfect vent and obviating the use of vent wires.

These machines are manufactured by the Peerless Manufacturing Co., Louisville, Ky.

THE Illinois Central Railroad Company use heavy Forney locomotives for operating their suburban traffic at Chicago, and the engines are very highly spoken of for the efficient way they perform this service. With a train of ten cars, they run 15 miles in 45 minutes and make 22 stops. The cylinders are 16 × 22 inches, and the driving-wheels 48 inches in diameter. A large boiler, 50 inches in diameter, is used to supply steam. These engines have a pony truck equalized with the front drivers, Mr. Schlacks claiming that the engines are too heavy for the whole to rest on the drivers and hind truck. Chicago suburban travelers have not learned to rush out of trains so quickly as people throng out of the New York Elevated Railroad cars, and considerable time is lost at each stop. But there is no time lost in getting the trains under way, and they are kept spinning till the next stopping place is almost reached. Mr. Snow, the Master Car-Builder of the road, complained at a meeting of the Western Railway Club about engineers applying the air-brakes violently, but if ever there was a justifiable excuse for so doing, it is in running these trains on schedule time.

DURING the recent trouble between the Baltimore and Ohio Railroad and the brakemen who objected to double-headed trains, the following reasons were given why running double-headed trains should not be practiced:

"1. That after giving the double-header system a four weeks' trial, we realize that owing to the condition of the track, trestles, tunnels and grades they are exceedingly dangerous to the life and limb of all employed in our department.

"2. That since this system has been in vogue there have been no less than five 'runaways' down grade, such as to cause every employé on three trains to meet their death before reaching the bottom of the hill.

"3. That our experience shows that two engines coupled in one train, and running over sinks in the track, such as are along the line of the Pittsburgh division, causes the train to be repeatedly breaking, thus making it not only dangerous to life and limb, but to the property of the company.

"4. That in shifting cars it is impossible for two engines to work alike, making it dangerous to the engine in coupling cars. This is not a strike for wages, nor is it a protest against doing the work of the road; neither is it on account of any dissension between the subordinate officers of the road and ourselves, as our relations have generally been of the most friendly character. It is our limbs and lives we would protect, which in the interest of our families and friends seems to render it proper that we stand firm until a satisfactory settlement can be had between the company and ourselves."

THE Pennsylvania Railroad Company have abolished the practice of preparing sheets showing the relative performance of their locomotives. They consider that making out performance sheets is a useless expenditure of time and money. A good many careless engineers will agree with them in this.

MR. GEORGE M. BRILL, of Philadelphia, has invented and patented a car axle-box where elaborate precautions are taken to prevent the access of dust and grit to the journal. The method employed to effect this end also prevents the escape of oil. The invention appears to be a valuable one.

MR. A. J. STEVENS, the General Master Mechanic of the Central Pacific road, is so well satisfied with the results of steam distribution obtained by his valve motion on freight locomotives, that he intends applying it to passenger engines. He believes that better means of expansion than the link motion provides, must be found before the full benefit can be obtained from the high steam pressures coming into use. Writing upon this subject, he says: "It is my opinion that a locomotive fitted with the link valve gearing, and cutting off at any particular point, will not do her work more economically with 150 pounds steam pressure than she will with 125 pounds, cutting off at the same point. To be sure, she will do more work, but I doubt if it will be done more economically. The steam, of course, is admitted at a higher pressure, but it is exhausted at a correspondingly higher pressure; so just where the saving comes in I am unable to see, though it may be there. If the steam could be cut off earlier in the stroke and retained longer in the cylinder, the higher pressure would undoubtedly be more economical." His valve gear has been used on an engine that reaches a piston speed of between 1,200 and 1,300 feet per minute.

THE "COMMON SENSE NUT-LOCK."—Devices for keeping fishplate bolts tight, have of late years occupied a prominent place among railroad inventions, which is a sure indication that something effective in this line is wanted. Our attention has recently been directed to a nut-lock in use on the station tracks of the Pittsburgh, Ft. Wayne & Chicago, and the Chicago, Burlington & Quincy roads, at Chicago, and which has for more than a year done excellent service under most heavy and difficult work. It is an exceedingly simple invention, consisting of a bolt with a slot about an inch deep milled into its end. When the nut is screwed up, this slot is forced open a little. No check-nut is required, yet the bolts we examined that had been long in use in the yard tracks, were perfectly tight. We believe it was the invention of a working machinist. This fastening, which is called the Common Sense Nut-Lock, has been adopted by the Chicago & Northwestern road as the standard for all their track work. Arrangements have been made to manufacture the device on a large scale by the Upton Nut Co., of Unionville, Conn., and Cleveland, Ohio. The Western Agent of the company, Mr. M. Hecklinger, 232 Lake street, Chicago, says the demand for this fastening has developed very rapidly within the last few months.

Friction and Lost Work in Machinery and Mill Work; by R. H. Thurston. John Wiley & Sons, 15 Astor Place, New York. Price $4.

Professor Thurston has been for years engaged in investigating the numerous problems relating to friction and lubrication, and this book contains the result of his deductions and discoveries. In numerous instances the data produced by carefully conducted experiments indicate that the work engaged in by Professor Thurston was needed by the mechanical world, for they show that certain laws of friction as given by accepted authorities were incorrect. The book contains a great deal of valuable information on a subject peculiarly interesting to railroad men, since the expense of operating railroad trains is directly influenced by the elimination of useless friction. But we fear that few practical railroad men will receive any benefit from the work, for to most of them it will be a sealed book on account of the profuse use of high algebraic formulas in working out the problems. Perhaps Professor Thurston could not explain the "theory of friction" without using the calculus to make his labors easy, but using that kind of mathematics will not permit a work to become popular, however much its profundity may reflect credit upon the author.

MR. F. J. Clamer, of the Ajax Metal Co., Philadelphia, has discovered a process by which aluminum can be produced at a low cost per pound and in large quantities. The process is said to be entirely practical in every way.

Our Directory.

We note the following changes since our last issue. Our readers will do us a great favor by giving us prompt notice of any changes that may come to their knowledge or of any errors that may be noticed in our list:

Batesville & Brinkley.—James Harrington has been appointed General Superintendent, vice E. Summerfield.

Chicago & Iowa.—H. D. Judson has been appointed Acting General Superintendent, in place of W. H. Holcomb, who has gone to the Chicago, Burlington & Northern road.

Cincinnati, Van Wert & Michigan.—E. M. Reynolds has resigned as Purchasing Agent.

Cleveland, Columbus, Cincinnati & Indianapolis.—Wm. Garstang succeeds T. W. Ranson as Master Mechanic of Indianapolis & St. Louis road, and Indianapolis Division. E. Hudson, late Foreman of the Cleveland shops, succeeds Mr. Garstang as Master Mechanic of the Columbus & Cincinnati Division.

Detroit, Mackinac & Marquette.—D. McCool has resigned as General Manager, to accept the same position on the St. Joseph & Western.

Denver Circle.—W. B. Sprague has been appointed Superintendent.

Houston & Texas Central.—George A. Quinlan has been appointed General Superintendent, vice J. Waldo.

Missouri Pacific.—J. J. Frey has been appointed Superintendent of the Missouri, Kansas & Texas Division, north of Parsons; T. T. Golden is Division Superintendent between Junction City and Denison, and M. C. Straight Superintendent of Western Division.

New Brunswick.—G. A. Haggerty has been appointed Mechanical Superintendent, with entire charge of the rolling stock of the line.

Port Jervis & Monticello.—James M. Warner has been appointed Superintendent in place of M. V. Heller, resigned.

St. Louis, Alton & Terre Haute.—P. H. Murphy has been appointed Master Mechanic, vice R. M. Pringle, resigned.

Employment.

WANTED—By a first-class Draftsman and practical Car-Builder of long experience, and best of recommendations from former employers, permanent employment in a railroad car shop, either as draftsman or on passenger car work in the shop, or both. Address F. H. G., office of NATIONAL CAR-BUILDER.

DIRECTORY

of the Railroads of the United States and Canada, showing the gauge, length of road, number of locomotives and number of cars; and giving the names and titles of their principal officers in charge of the operating, purchasing and rolling stock departments

A

Adirondack R. R. 4-8½ gauge 60 m. 3 lo. 62 cars.
C. E. Durkee, *Supt* ...... Saratoga, N. Y.
Jacob Myers, *M. M* ...... Saratoga, N. Y.
Jas. J. Traver, *M. C. B* ...... Saratoga, N. Y.
Addison & Northern Penn'a Ry. 3 g. 51 m. 5 lo. 50 c.
F. M. Baker, *Gen. Supt* ...... Addison, N. Y.
Alabama Great So'n R. R. (*See Cin., N. O. & T. P.*)
Albany & Susquehanna R. R. (*See D. & H. Canal Co.*)
Albemarle & Raleigh R. R. 4-8½ g. 33 m. 3 lo. 35 c.
Jas. H. Petty, *Gen. Supt* ...... Tarboro, N. C.
Albert Ry. 4-8½ g. 51 m. 3 lo. 35 cars.
G. A. Robinson, *Man. & Pur. Agt.* Hillsboro, N. B.
Jas. McKay, *M. M. & C. B* ...... Hillsboro, N. B.
Alexandria & Fredericksburg Ry. { *See Penna. R. R.;*
Alexandria & Washington R. R. { (7) *Div.*
Allegheny Valley R. R. 4-9 g. 259 m. 70 lo. 2202 c.
David McCargo, *Gen. Supt. & Pur. Agt.;* and
C. B. Price, *Supt.* (Riv. Div.) ...... Pittsburg, Pa.
A. A. Jackson, *Supt.* (L. G. Div.). Reynoldsville, Pa.
W. A. Wood, *M. M* ...... Verona, Pa.
R. Gunning, *M. C. B* ...... Verona, Pa.
Alliance, Niles & Ashtabula R. R. (*See Penna. Co.*)
Annapolis & Elk Ridge R. R. 4-8½ g. 20 m. 4 lo. 29 c.
W. H. Bians, *Supt. & Pur. Agt.* Annapolis, Md.
John L. Beall, *M. Mach* ...... Annapolis, Md.
Anniston & Atlantic R. R. 3 g. 9 m.
Tho. K. Scott, *Supt.* ...... Anniston, Ala.
Antwerp & Paulding R. R. 4-8½ g. 6 m. 4 lo. 63 c.
E. C. Munson, *Gen. Man* ...... Antwerp, O.
William Fitzsimmons, Jr., *Pur. Agt.* Antwerp, O.
Arizona & New Mexico Ry. 3 g. 71 m. 3 l. 60 cars.
W. H. Jones, *Gen. Supt. & P. A.* Lordsburg, N. M.
W. C. Boylan, *M. M. & M. C. B.* Lordsburg, N. M.
Arkansas Midland R. R. 3-6 g. 63 m. 4 lo. 45 cars.
A. H. Johnson, *Pr. & Gen. Man* ... Helena, Ark.
J. B. Johnson, *M. M. & M. C. B* ... Helena, Ark.
Arkansas & Louisiana Ry. 4-8½ g. 28 m.
J. D. Beardsley, *Supt* ...... Washington, Ark.
Asheville & Spartanburg R. R. 5 g. 43 m. 2 lo. 12 c.
Jas. Anderson, *Supt. & Pur. Agt.* Spart'b'g, S. C.
M. M ...... Spartanburg, S. C.
Ashland Coal & Iron Ry. 4-8½ g. 22 m. 7 lo. 432 c.
Douglas Putnam, Jr., *Gen. Supt.* Ashland, Ky.
Robt. Peebles, *Pur. Agt* ...... Ashland, Ky.
E. M. Roberts, *M. M* ...... Ashland, Ky.
Ashtabula & Pittsburgh Ry. (*See Penna. Co.*)
Atchison, Topeka & Santa Fé R. R.
4-8½ g. 2,020 m. 348 lo. 9,629 cars.
A. A. Robinson, *Gen. Man* ...... Topeka, Kan.
Geo. Hackney, *Supt. Mach* ...... Topeka, Kan.
Clem. Hackney, *Asst. Sup. Mach. Dept.* do.
A. C. Armstrong, *Pur. Agt* ...... Topeka, Kan.
Eastern Div.: D. J. Chase, *Supt.* ...... Topeka, Kan.
Henry Hull, *G. F. Car Dept* ...... Topeka, Kan.
John Fagan, *M. M* ...... Atchison, Kan.
J. M. Smith, *M. M* ...... Kansas City, Mo.
Alfred Taylor, *M. M* ...... Emporia, Kan.
Mid. Div.: H. R. Nickerson, *Supt.* Nickerson, Kan.
W. Y. Johnson, *M. M* ...... Nickerson, Kan.
W. Div.: C. M. Rathburn, *Supt* ...... La Junta, Col.
A. C. Stiles, *M. M* ...... La Junta, Col.
D. H. Dotterer, *M. M* ...... Raton, N. M.
Las Vegas Div.: Chas. Dyer, *Supt.* Las Vegas, N. M.
F. B. Woodruff, *M. M* ...... Las Vegas, N. M.
J. H. Holman, *M. M* ...... Wallace, N. M.
Rio Gr. Div.: P. F. Barr, *Supt.* San Marcial, N. M.
E. Hackett, *M. M* ...... San Marcial, N. M.
H. P. Olcott, *M. M* ...... Deming, N. M.
Geo. A. Hancock, *M. M* ...... El Paso, Tex.
Sonora Div.: 265 m.
L. H. Waugh, *M. M* ...... Guaymas, Mex.
Kan. Cy., Law. & So. Kan.
4-8½ g. 399 m. 24 lo. 787 c.
J. L. Barnes, *Supt* ...... Lawrence, Kan.
T. D. Volk, *M. M* ...... Ottawa, Kan.
Atlanta & West Point R. R. (*See Western of Ala.*)
Atlantic & Danville Ry. 3 g. 17 m.
E. G. Sweatt, *Gen. Man* ...... Waverly, Va.
Atlantic & North Carolina R. R. (*See Midland; N. C.*)
Atlantic, Tenn. & Ohio R. R. (*See Rich. & Dan.;* (2) *Div.*)
Atlantic & Pacific R. R. 4-8½ g. 575 m.
F. W. Smith, *G. Supt* ...... Albuquerque, N. M.
F. P. Wherry, *Pur. Agt* ...... St. Louis, Mo.
Geo. Chalender, *Supt. M. P. & M.*, and
Geo. F. Chalender, *A. Supt.* Albuquerque, N. M.
B. C. Bosworth, *M. M* ...... Coolidge, N. M.
Augusta & Knoxville R. R. (*See Port Royal & Aug.*)
Austin & Northwestern R. R. 3 g. 60 m. 5 lo. 75 c.
J. A. Rhomberg, *Gen. Man* ...... Austin, Tex.

B

Bachman Valley R. R. (*See Han. Junc., Han. & Gett.*)
Balt. & Delaware Bay R. R. 4-8½ g. 50 m. 2 lo. 13 c.
Fred Gerker, *Gen. M. & P. A.* Chestertown, Md.
Baltimore & Hanover R. R. (*See H. J., H. & G.*)
Baltimore & Ohio R. R.
4-8½ g. 1,612 m. 574 lo. 17,339 cars.
B. Dunham, *Gen. Man* ...... Baltimore, Md.
N. S. Hill, *Pur. Agt* ...... Baltimore, Md.
Main Stem Div.: 4-8½ g. 972 m.
W. M. Clements, *Gen. Supt* ... Baltimore, Md.
A. J. Cromwell, *M. of M* ...... Baltimore, Md.
E. W. Grieves, *M. C. B* ...... Baltimore, Md.
Andrew Beckett, *M. M* ...... Baltimore, Md.
Wm. Edwards, *M. M* ... Martinsburg, W. Va.
Sam. Houston, *M. M* ...... Piedmont, W. Va.
Robert Maxwell, *M. M* ...... Cumberland, Md.
W. P. Harris, *Supt. West of* Cumberland, Md.
S. B. Crawford, *M. M* ...... Grafton, W. Va.
Alex. Laird, *M. M* ...... Parkersburg, W. Va.
W. B. McClung, *M. M* ...... Wheeling, W. Va.
Pitts. Div.: H. P. Harris, *Supt* ...... Pittsburgh, Pa.
I. N. Kalbaugh, *M. of M* ...... Pittsburgh, Pa.
Trans-Ohio Divs.: G. J. Foreacre, *G. Supt.* Newark, O.
W. H. Harrison, *M. of Mach* ...... Newark, O.
E. L. Weisgerber, *M. M* ...... Newark, O.
H. M. Ingler, *M. M* ...... Bellaire, O.
O. B. Perkins, *M. M* ...... Zanesville, O.
Thos. Taylor, *M. M* ...... Sandusky, O.
F. J. Gunther, *M. M* ...... Chicago Junction, O.
Chi. Div.: F. H. Britton, *Supt. Trans.* Chicago, Ill.
Benj. Lowther, *M. M* ...... Garrett, Ind.
C. H. Campbell, *M. M* ...... So. Chicago, Ill.
Newark & Straitsville Div.: N. Criswell, Shawnee, O.
Baltimore & Philadelphia. 4-8½ g. 40 m. 7 lo. 35 c.
B. Dunham, *Gen. Man* ...... Baltimore, Md.
Jas. McCreighton, *Supt* ...... Wilmington, Del.
Baltimore & Potomac R. R. (*See Penna. R. R.;* (7) *Div.*)
Bangor & Piscataquis R. R. 4-8½ g. 63 m. 4 lo. 87 cars.
Arthur Brown, *Supt. & Pur. Agt.* Bangor, Me.
C. S. Nason, *M. M* ...... Bangor, Me.
J. W. Comins, *M. C. B* ...... Oldtown, Me.
Bangor & Portland Ry. 4-8½ g. 25 m. 3 lo. 3 c.
C. Miller, *Pres. & Gen. Man* ... Blairstown, N. J.
Barclay R. R. 4-8½ g. 16 m. 6 l. 200 c.
F. F. Lyon, *Supt* ...... Barclay, Pa.
J. A. Hardenburg, *Pur. Agt.* 21 Cort. st., N. Y.
Wm. Johnson, *M. M* ...... Towanda, Pa.
Batesville & Brinkley R. R. 3 g. 40 m. 3 lo. 42 c.
R. W. Martin, *Pres* ...... Little Rock, Ark.
W. J. Thompson, *Gen. Man* ... Little Rock, Ark.
Jas. Harrington, *Gen. Supt* ...... Brinkley, Ark.
John White, *M. M* ...... Brinkley, Ark.
Bath & Hammondsport R. R. 3 g. 10 m.
Allen Wood, *Gen. Man* .. Hammondsport, N. Y.
Baton Rouge, Grosse Tête & Opelousas R. R.
5-6 g. 29 m. 3 lo. 12 c.
D. C. Montan, *Gen. Supt* ...... Port Allen, La.
Bedford & Bloomfield Ry. 3 g. 43 m. 5 lo. 86 cars.
Jas. W. Kennedy, *Gen. Supt. & Pur. Agt.;* and
Capt. John Thumser, *M. M* ...... Bedford, Ind.
Jas. Richards, *M. C. B* ...... Bedford, Ind.
Bellaire, Zanesville & Cin. Ry. Co. 3 g. 112 m. 5 lo. 71 c.
S. L. Mooney, *Pres* ...... Woodsfield, O.
W. R. Crumpton, *Gen. Man* ...... Zanesville, O.
C. E. Hill, *M. M* ...... Zanesville, O.
Bell's Gap R. R. 4-9 g. 25 m. 5 lo. 148 cars.
R. G. Ford, *Supt. & Pur. Agt* ... Bellwood, Pa.
Geo. Van Brunt, *M. M* ...... Bellwood, Pa.
A. Zimmerman, *M. C. B* ...... Bellwood, Pa.
Belt R. R. 4-8½ g. 12 m. 10 lo.
W. P. Ijams, *Supt* ...... Indianapolis, Ind.
Belt Ry. 4-8½ g. 27 m.
Jas. D. Carson, *Gen. Man* ...... Chicago, Ill.
R. W. Johnson, *M. M* ...... Chicago, Ill.
Bennington & Glastonbury. 4-8 g. 10 m.
R. C. Root, *Pres* ...... Bennington, Vt.
Bennington & Rutland Ry. 4-8½ g. 59 m. 10 lo. 236 c.
E. D. Bennett, *Supt. & Pur. Agt.* Bennington, Vt.
Ghas. McMasters, *M. M* ...... Rutland, Vt.
Berlin Branch R. R. (*See Han. Junc., Han. & Gett.*)
Bladen, Columbus & Florida. 4-8½ g. 16 m. 2 lo. 2 c.
John Colville, *Pres* ...... Wilmington, N. C.
Bodie & Benton Ry. & Com. Co. 3 g. 34 miles.
Thomas Holt, *Supt. & Pur. Agt* ...... Bodie, Cal.
E. H. Barton, *M. M. & C. B* ...... Bodie, Cal.
Boston, Barre & Gardner. 4-8½ g. 37 m. 8 lo. 108 c.
Supt. & P. A. .. Worcester, Mass.
Frank I. Goodwin, *M. M* ...... Worcester, Mass.
Boston, Hoosac Tunnel & W'n Ry.
4-8½ g. 87 m. 18 lo. 1,038 cars.
H. L. Morrill, *Gen. Man* .. Mechanicsville, N. Y.
C. H. Cory, *Pur. Agt* ...... Mechanicsville, N. Y.
C. H. Cory, *Supt. & M. M.* Mechanicsville, N. Y.
John S. Ellis, *M. C. B* ...... Mechanicsville, N. Y.
Boston, Revere Beach & Lynn R. R. 3 g. 9 m. 7 lo. 55 c.
C. A. Hammond, *Supt. & P. Agt.* Boston, Mass.
R. D. Sutherland, *M. M* ...... Boston, Mass.
John Coghlan, *M. C. B* ...... Boston, Mass.
Boston, Winthrop & Point Shirley R. R.
3 g. 10 m. 1 lo. 8 c.
C. A. Parks, *Supt* ...... Boston, Mass.
J. W. Davis, *M. M* ...... Winthrop, Mass.
Boston & Albany R. R. 4-8½ g. 372 m. 245 lo. 6,111 c.
W. H. Barnes, *Gen. Man* ...... Boston, Mass.
Edw. Gallup, *Gen. Supt* ...... Springfield, Mass.
A. B. Underhill, *Supt. M. P* ... Springfield, Mass.
F. D. Adams, *Gen. M. C. B* ...... Allston, Mass.
J. T. Chamberlain, *For. C. Shop* Allston, Mass.
H. B. Chesley, *Div. Supt* ...... Boston, Mass.
G. H. Colby, *Div. M. M* ...... Boston, Mass.
C. E. Grover, *Div. Supt* ...... Springfield, Mass.
H. W. Eddy, *Div. M. M* ...... Springfield, Mass.
J. B. Weston, *For. Car Sh.* Springfield, Mass.
W. H. Russell, Jr., *Div. Supt.* E. Albany, N. Y.
T. B. Purvis, *Div. M. M* ... East Albany, N. Y.
J. E. Doran, *For. Car Sh* .. East Albany, N. Y.
Boston & Lowell R. R.
4-8½ g. 555 m. 147 lo. 3,262 cars.
C. S. Mellen, *Gen. Supt* ...... Boston, Mass.
F. H. Nourse, *Pur. Agt* ...... Boston, Mass.
Jas. K. Taylor, *Supt. R. S. & M.* Concord, N. H.
So. Div.: J. F. Crockett, *Supt.* ...... Boston, Mass.
H. S. Kolseth, *M. M* ...... Boston, Mass.
No. Div.: Geo. A. Todd, Supt ...... Concord, N. H.
Geo. E. Shepard, *Pur. Agt* ...... Concord, N. H.
C. C. Aspinwall, *M. M* ...... Concord, N. H.
Wh. Mt. Div.: W. A. Stowell, *Supt.* Woodsville, N. H.
Geo. A. Ferguson, *M. M* .. Lake Village, N. H.
Boston & Maine R. R. 4-8½ g. 491 m. 209 lo. 4,660 c.
J. T. Furber, *Gen. Man* ...... Boston, Mass.
Geo. J. Fisher, *Pur. Agt* ...... Boston, Mass.
Wm. Smith, *Supt. M. P* ...... Boston, Mass.
D. C. Richardson, *M. C. B* ...... Lawrence, Mass.
West. Div.: Wm. Merritt, Jr., *Supt.* Boston, Mass.
East. Div.: D. W. Sanborn, *Supt.* .. Boston, Mass.
North Div.:
J. W. Sanborn, *Supt.* .. Wolfboro Junc., N. H.
Boston & N. Y. Air Line R. R. (*See N. Y., N. H. & H.*)
Boston & Providence R. R. 4-8½ g. 67 m. 52 lo. 1,006 c.
A. A. Folsom, *Gen. Supt. & P. A.* Boston, Mass.
Geo. Richards, *M. M* ...... Roxbury, Mass.
Jno. Lightner, *M. C. B* ...... Roxbury, Mass.
Bowling Green & Toledo R. R. 4-8½ g. 6 m. 2 lo. 4 c.
Wm. A. Wiggins, *Gen. Man.* Bowling Green, O.
Wm. A. Wiggins, *Pur. Agt.* .. Bowling Green, O.
Bradford, Bordell & Kinzua R. R. 3 g. 42 m. 6 lo. 82 c.
Bradford, Eldred & Cuba. 3 g. 54 m. 6 l. 158 c.
Tonawanda Valley & Cuba. 3 g. 60 m. 5 lo. 31 c.
J. V. D. Loomis, *Supt* ...... Attica, N. Y.
Jno. Delaney, *M. M. & C. B* ...... Bradford, Pa.
Brattleboro' & Whitehall R. R. 3 g. 36 m. 3 lo. 56 c.
(*Operated by Central Vermont.*)
Bridgton & Saco River R. R. 2 g. 16 m. 2 lo. 19 c.
Wm. F. Perry, *Gen. Supt* ...... Bridgton, Me.
M. M. Caswell, *M. M. & Pur. Agt.* Bridgton, Me.
Brighthope Ry. 3 g. 37 m. 4 lo. 193 cars.
Jas. R. Worth, *Supt* ...... Richmond, Va.
P. M. Buckingham, *Pur. Agt* Richmond, Va.
A. Gary, *Supt. Way & Works.* Winterpock, Va.
Robt. Kredell, *M. M* ...... Chester, Va.
Brooklyn, Bath & Coney Island R. R.
4-8½ g. 7 m. 8 lo. 36 cars.
Geo. A. Gunther, *Gen. Man* ... Brooklyn, N. Y.
Aug. Wolff, *M. M* ...... Brooklyn, N. Y.
Brooklyn, Flatbush & Coney Island Ry.
4-8½ g. 8 m. 8 lo. 54 c.
J. L. Morrow, *Supt. & P. A* ... Brooklyn, N. Y.
Wm. Finley, *M. M* ...... Brooklyn, N. Y.
Brooklyn & Rockaway Beach R. R.
4-8½ g. 3 m. 2 lo. 18 cars.
Wm. Warner, *Supt* ...... East New York, N. Y.
Brunswick & Western R. R. 5 g. 172 m. 13 lo. 170 c.
A. A. Gaddis, *Gen. Man. & P. A.* Brunswick, Ga.
J. K. Nightengale, *Pur. Agt* ... Brunswick, Ga.
W. R. Kline, *M. M* ...... Brunswick, Ga.
Buff., N. Y. & Phil. R. R. 3 & 4-8½ g. 655 m. 120 l. 6,339 c.
Geo. S. Gatchell, *Gen. Supt* ...... Buffalo, N. Y.
W. W. Halsey, *Asst. to G. Supt* .. Buffalo, N. Y.
Allen Vail, *M. M* ...... Buffalo, N. Y.
Buff. Div.: Henry Dwyer, *Supt* ...... Buffalo, N. Y.
Roch. Div.: J. R. Watson, *Supt* ...... Olean, N. Y.
Pitts. Div.: E. H. Witter, *Supt* ...... Oil City, Pa.
H. J. Bookhammer, *M. M* ...... Oil City, Pa.
C. E. Turner, *M. M* ...... Olean, N. Y.
Burlington, Cedar Rapids & Northern Ry.
4-8½ g. 989 m. 96 lo. 4,206 cars.
C. J. Ives, *Pres. & Gen. Supt.* Cedar Rapids, Ia.
Robt. Williams, *V. P. & G. Supt.* Cedar Rapids, Ia.
T. Stickney, *Pur. Agt* ...... Cedar Rapids, Ia.
R. W. Bushnell, *M. M. & C. B.* Cedar Rapids, Ia.
Burlington & Lamoille R. R. 4-8½ g. 35 m. 4 lo. 64 c.
G. L. Linsley, *Gen. Man. & Supt.* Burlington, Vt.
F. G. Brownell, *M. M* ...... Burlington, Vt.
Burlington & Mo. Riv. R. R. (in Neb.) (*See C. B. & Q.*)
Burlington & North-West'n Ry. 3 g. 38 m. 3 lo. 97 c.
Burlington & Western R. R. 3 g. 15 m. 38 c.
E. S. Edger, *Supt* ...... Burlington, Ia.
Burlington & Ohio River R. R. 4-8½ g.
R. Tanner, *Pur. Agt* ...... Chicago, Ill.

C

California Northern R. R. 4-8½ g. 26 m. 2 lo. 17 c.
Andrew J. Binney, *Gen. Man* .. Marysville, Cal.
California Southern R. R. 4-8½ g. 127 m. 13 lo. 301 c.
J. N. Victor, *Supt* ...... National City, Cal.
J. M. Keith, *M. M* ...... National City, Cal.
Camden & Atlantic R. R. (*See Penna. R. R.;* (2) *Div.*)
Canada Southern Ry. (*See Mich. Cen.;* (2) *Div.*)
Canada Atlantic Ry. 4-8½ g. 135 m.
D. C. Linsley, *Man* ...... Ottawa, Ont.
M. Donaldson, *M. M* ...... Ottawa, Ont.
Canadian Pacific R. R. 4-8½ g. 1,742 m. 118 l. 2,726 c.
W. C. Van Horne, *Gen. Man* ...... Montreal, Can.
Francis R. F. Brown, *Mech. Supt.* Montreal, Can.
W. H. Kelson, *Gen. Storekeeper* Montreal, Can.
E. Div.: *Gen. Supt* Montreal, Can.
W. Div.: J. M. Egan, *Gen. Supt* .. Winnipeg, Man.
Ontario Div.: W. White, *Gen. Supt* Montreal, Can.
Cape F'r & Yadkin Val. R. R. 4-8½ g. 112 m. 7 lo. 60 c.
W. M. S. Dunn, *Gen. Supt* ... Fayetteville, N. C.
Isaac W. Clark, *M. M. & C. B.* .. Fayetteville, N. C.
Cape Girardeau Southwestern Ry.
4-8½ g. 52 m. 3 lo. 51 cars.
Louis Houck, *Gen. Man* .. Cape Girardeau, Mo.
W. A. Penney, *Supt* ...... Cape Girardeau, Mo.
D. L. Meyers, *Pur. Agt* ... Cape Girardeau, Mo.
Fred Glover, *M. M* ...... Cape Girardeau, Mo.
Carolina Central R. R. (*See Ral. & Aug.*)
Carillon & Grenville Ry. 5-6 g. 13 m.
R. W. Shepard, *Pres* ...... Montreal, Can.
Carson & Colorado R. R. (*See Va. & Truckee*).
Catasauqua & Fogelsville. 4-8½ g. 25 m. 6 lo. 581 c.
C. W. Chapman, *Supt. & P. A.* Catasauqua, Pa.
J. Thomas, *M. M* ...... Hokendauqua, Pa.
Chas. J. Holbach, *M. C. B* ...... Catasauqua, Pa.
Catskill Mountain R. R. 3 g. 16 m. 2 lo. 26 cars.
Charles A. Beach, *Supt* ...... Catskill, N. Y.
Cazenovia, Canastota & De Ruyter. (*See U., I. & E.*)
Central and South-Western Railroads (Ga.).
5 g. 1,115 m. 145 lo. 2,008 cars.
W. G. Raoul, *Pres* ...... Savannah, Ga.
Wm. Rogers, *Gen. Supt* ...... Savannah, Ga.
C. H. Carson, *Pur. Agt* ...... Savannah, Ga.
Cen. Div.: D. D. Arden, *M. M* ...... Savannah, Ga.
T. F. Warwick, *M. M* ...... Augusta, Ga.
F. Devine, *M. C. B* ...... Savannah, Ga.
So.-West'n Div.: T. D. Kline, *Supt* ...... Macon, Ga.
D. M. Gugel, *M. M* ...... Macon, Ga.
S. A. Charpiot, *M. C. B* ...... Macon, Ga.
Central R. R. of N. J. (*See Phil. & Read.; N. J. Cen. Div.*)
Central American & Pacific Ry. 3 g. 67 m. 1 lo. 11 c.
W. C. Fitzsimmons, *Gen. Supt.* Escuintla, Guat.
Central Branch Union Pac. (*See Mo. Pac.;* (3) *Div.*)
Central Iowa Ry. 4-8½ g. 412 m. 50 lo. 2,313 cars.
E. L. Dudley, *Supt* ...... Marshalltown, Ia.
J. G. Johnston, *Asst. Supt* ...... Marshalltown, Ia.
D. D. Phelps, *Asst. Supt* ...... Monmouth, Ill.
C. H. Ackert, *Pur. Agt* ...... Marshalltown, Ia.
John Player, *M. M. & M. C. B.* Marshalltown, Ia.
Central Ontario Ry. 4-8½ g. 33 m. 4 lo. 66 cars.
J. B. McMullen, *Gen. Man* ...... Picton, Ont.
James Falconar, *M. M* ...... Trenton, Ont.
Central Pac. R. R. 4-8½ g. 4,303 m. 382 lo. 11,260 c.
A. N. Towne, *Gen. Man* ...... San Francisco, Cal.
J. A. Fillmore, *Gen. Supt* ... San Francisco, Cal.
R. H. Pratt, *A. G. Supt* ...... San Francisco, Cal.
J. R. Watson, *Gen. Pur. Agt.* Sacramento, Cal.
A. J. Stevens, *Gen. M. M* ...... Sacramento, Cal.
W. McKenzie, *Asst. G. M. M.* Sacramento, Cal.
Benj. Welch, *Gen. M. C. B* ...... Sacramento, Cal.
G. J. Turner, *Asst. G. M. C. B.* Sacramento, Cal.
Western: Visalia & Tulare Divs. and Northern Ry.
A. D. Wilder, *Supt* ...... W. Oakland, Cal.
G. D. Welch, *M. M.* (W. Div.) W. Oakland, Cal.
W. B. Ludlow, *M. C. B.* (W. Div.) do.
S. Johnson, *M. M.* (T. Div.) ...... Tulare, Cal.
J. B. Wright, *Supt* ...... Sacramento, Cal.
M. W. Cooley, *M. M.* (*S. Div.*) .. Rocklin, Cal.
Truckee Div.: J. H. Whited, *Supt.* Wadsworth, Nev.
Geo. Gregg, *M. M* ...... Wadsworth, Nev.
Wm. McPherson, *F. Car Sh* .. Wadsworth, Nev.
Humb't Div.: G. W. Coddington, *Supt.* Carlin, Nev.
W. F. Smith, *M. M* ...... Carlin, Nev.
J. C. Doughty, *For. Car Sh* ...... Carlin, Nev.
Salt Lake Div.: A. G. Fell, *Supt* ...... Ogden, Utah.
James Lamb, *M. M* ...... Terrace, Utah.
A. Sherburne, *For. Car Sh* ...... Ogden, Utah.
St. & Cop. R. R.: R. L. Myrick, *Supt.* Stockton, Cal.
Los Angeles; and Yuma Divs. (So. Pac.):
E. E. Hewitt, *Asst. Supt* ...... Los Angeles, Cal.
James Velsir, *M. M* ...... Los Angeles, Cal.
T. T. Gilleland, *For. Car Sh.* Los Angeles, Cal.
Arizona Divs. (So. Pac.):
J. A. Muir, *Asst. Supt* ...... Tucson, Ariz.
W. F. Smith, *M. M* ...... Tucson, Ariz.
Rio Grande (S. Pac.) & El Paso (G. H. & S. A.) Divs.:
C. B. Seymour, *Supt* ...... El Paso, Texas.
J. L. Bonner, *M. M* ...... El Paso, Texas.
H. C. Standish, *For. Sh* ...... El Paso, Texas.
Central Texas & N'w'n R. R. (*See Hous. & Tex. Cen.*)
Central Vermont R. R. 4-8½ g. 864 m. 185 lo. 2,789 c.
J. W. Hobart, *Gen. Man* ...... St. Albans, Vt.
J. M. Foss, *Gen. Supt* ...... St. Albans, Vt.
W. J. Robertson, *Supt. M. P* ... St. Albans, Vt.
No. Div.: I. B. Futvoye, *Supt* ...... St. Johns, P. Q.
Rut. Div.: J. Burdett, *Supt* ...... Rutland, Vt.
N. L. Davis, *M. M. & C. B* ...... Rutland, Vt.
Brattleboro & Whitehall R. R., and
Brat. Div.: E. F. Brooks, *Supt* ... Brattleboro, Vt.
New London No'n R. R. 143 m. 22 lo. 303 c.
C. F. Spaulding, *Supt. & P. A.* New London, Ct.
I. N. Dow, *M. M* ...... New London, Ct.
S. O. Banks, *M. C. B* ...... New London, Ct.
Chagrin Falls & Southern R. R. 3 g. 6 m. 1 lo. 12 c.
W. Hutchings, *Gen. Man* ...... Chagrin Falls, O.
J. W. Williams, *Gen. Supt* ...... Chagrin Falls, O.
Charleston & Savannah Ry. 5 g. 115 m. 15 lo. 200 c.
H. S. Haines, *Gen. Man* ...... Savannah, Ga.
C. S. Gadsden, *Gen. Supt* ...... Charleston, S. C.
H. A. Ulmo, *M. M* ...... Savannah, Ga.
Charlotte, Columbia & Augusta R. R. (*See Rich. & D.*)
Chateaugay R. R. 3 g. 34 m. 8 lo. 380 cars.
A. L. Inman, *Gen. Man* ...... Plattsburg, N. Y.
J. M. Davies, *Supt* ...... Lyon Mountain, N. Y.
M. L. French, *Asst. Supt* ...... Plattsburg, N. Y.
Chatham Ry. 4-8½ g. 9 m.
J. B. Snowball, *Man* ...... Chatham, N. B.
Chattaroi Ry. 4-8½ g. 51 miles 11 loco. 483 cars.
J. H. Northrop, *Gen. Man. & P. A.* Ashland, Ky.
J. R. Martin, *M. M* ...... Ashland, Ky.
Joseph P. Burleigh, *M. C. B* ...... Ashland, Ky.
Cheraw & Chester R. R. (*See Rich. & Dan.;* (2) *Div.*)
Cheraw & Darlington R. R. (*See Wil. & Wel.*)
Cheraw & Salisbury R. R. (*See Wil. & Wel.*)
Cherokee R. R. (*See East & West.*)
Cherry Valley R. R. 4-8½ g. 6 m. 3 lo. 6 cars.
E. T. Herndon, *Supt* ...... Midland, Mo.
Chesapeake, Ohio & South-Western.
4-9 g. 398 m. 62 lo. 1,345 c.
Jas. L. Frazier, *Supt* ...... Louisville, Ky.
H. E. Huntington, *Pur. Agt* ...... Louisville, Ky.
J. A. Dew, *Mast. Trans* ...... Paducah, Ky.
R. H. Briggs, *Supt. M. P* ...... Paducah, Ky.
D. L. Weaver, *M. M* ...... Elizabethtown, Ky.
Jno. Fitzgerald, *M. M* ...... Paducah, Ky.
Chesapeake & Ohio Ry. 4-8½ g. 642 m. 169 l. 5,120 c.
C. W. Smith, *Gen. Man* ...... Richmond, Va.
D. A. Sweet, *Asst. to Gen. Man.* Richmond, Va.
A. S. Emmons, *Pur. Agt* ...... Richmond, Va.
T. L. Chapman, *Supt. M. P* ...... Richmond, Va.
Eastern Div.: A. H. Wood, *Supt* .. Richmond, Va.
J. N. King, *M. C. B* ...... Richmond, Va.
J. B. Pierce, *M. M* ...... Richmond, Va.
Hunt. Div.: W. B. Ryder, *Supt* ...... Hinton, W. Va.
W. H. Thomas, *M. M* .. Huntington, W. Va.
H. C. Bassinger, *M. C. B.* Huntington, W. Va.
Lex. Div.: J. D. Yarrington, *Supt.* Lexington, Ky.
S. R. Tuggle, *M. M* ...... Lexington, Ky.
K. C. Div.: G. W. Bender, *Supt* .. Covington, Ky.
W. T. Smith, *M. M* ...... Covington, Ky.
Cheshire R. R. 4-8½ g. 80 m. 31 lo. 531 cars.
R. Stewart, *Gen. Man* ...... Keene, N. H.
H. H. Stone, *Pur. Agt* ...... Keene, N. H.
F. A. Perry, *M. M* ...... Keene, N. H.
A. E. Howard, *M. C. B* ...... Keene, N. H.
Chester & Lenoir Ry. (*See Rich. & Dan.;* (3) *Div.*)
Chicago, Bur. & Kan. City Ry. (*See C. B. & Q.*)
Chicago, Burlington & Quincy R. R.
4-8½ g. 3,608 m. 545 lo. 21,012 cars.
H. B. Stone, *Gen. Man* ...... Chicago, Ill.
(1) C., B. & Q., East of Mo. Riv.
J. D. Besler, *Gen. Supt* ...... Chicago, Ill.
Wm. Irving, *Gen. Pur. Agt* ...... Chicago, Ill.
G. W. Rhodes, *Supt. M. P* ...... Aurora, Ill.
Wm. Forsyth, *Mech. Eng* ...... Aurora, Ill.
Ill. Divs.: C. F. Resseguie, *Supt* ... Galesburg, Ill.
Chi. Div., Geo. Alexander, *Supt* ...... Aurora, Ill.
L. E. Johnson, *M. M* ...... Aurora, Ill.
Galesburg Div.: F. C. Rice, *Supt.* Galesburg, Ill.
Robert Colville, *M. M* ...... Galesburg, Ill.
St. L. Div.: W. C. Brown, *Supt* .. Beardstown, Ill.
A. Forsyth, *M. M* ...... Beardstown, Ill.
Ia. & Mo. Divs.: W. F. Merrill, *Supt.* Burlington, Ia.
East. Div.: O. E. Stewart, *Supt* .. Burlington, Ia.
Joel West, *M. M* ...... Burlington, Ia.
Mid. Div.: J. B. Maxon, *Supt* ...... Ottumwa, Ia.
West'n Div.: J. H. Duggin, *Supt* ...... Creston, Ia.
C. W. Eckerson, *M. M* ...... Creston, Ia.
Chi., B. & Kan. C'y and St. L., Keo. & No.-W'n Rys.
Robt. Law, *Gen. Supt* ...... Keokuk, Ia.
W. H. Bartlett, *M. M* ...... Burlington, Ia.
(2) C. B. & Q., West of Mo. Riv.
G. W. Holdrege, *Gen. Man* ...... Omaha, Neb.
C. M. Wead, *Supply Agt* ...... Omaha, Neb.
D. Hawksworth, *M. M* ...... Plattsmouth, Neb.
C. M. Wead, *Storek'pr* ...... Plattsmouth, Neb.
Bur. & Mo. Riv. & Neb. Ry. Divs.:
T. E. Calvert, *Gen. Supt* ...... Lincoln, Neb.
D. E. Thompson, *Supt* ...... Lincoln, Neb.
E. Bignell, *M. M* ...... Lincoln, Neb.
R. V. Div.: A. Campbell, *Supt* ...... McCook, Neb.
A. & N. Div.: J. McConniff, *Supt* .. Lincoln, Neb.
Chicago, Fairchild & Eau Claire R. R.
4-8½ g. 22 m. 4 lo. 28 cars.
N. C. Foster, *Gen. Man* ...... Fairchild, Wis.
C. I. Wickersham, *Pur. Agt* ...... Chicago, Ill.
Chicago, Iowa & Dakota Ry. 4-8½ g. 26 m.
John Porter, *Gen. Man* ...... Eldora, Ia.
Chicago, Milwaukee & St. Paul R. R.
4-8½ g. 5,201 m. 626 lo. 19,018 cars.
Roswell Miller, *Gen. Man* ...... Milwaukee, Wis.
Jos. F. Tucker, *Asst. Gen. M* .. Milwaukee, Wis.
J. T. Clark, *Gen. Supt* ...... Milwaukee, Wis.
A. J. Earling, *Asst. Gen. Supt.* Milwaukee, Wis.
J. T. Crocker, *Pur. Agt* ...... Milwaukee, Wis.
J. M. Lowry, *Gen. M. M* ...... Milwaukee, Wis.
E. Fairbairn, *M. M* ...... Milwaukee, Wis.
John Baille, *Supt. Car Dept* ... Milwaukee, Wis.
W. E. Kittridge, *M. C. B* ...... Milwaukee, Wis.
(1) C. & M. and C. & C. B. in Ill.:
G. O. Clinton, *Supt* ...... Chicago, Ill.
Ch. & C. B. in Ia.:
R. B. Campbell, *Supt* ...... Marion, Wis.
La C. & Wis. Val. Divs.:
W. G. Collins, *Supt* ...... Milwaukee, Wis.
P. du C. & M. Pt. Divs.:
S. J. Collins, *Supt* ...... Milwaukee, Wis.
(2) C. H. Prior, *Asst. Gen. Supt* .. Minneapolis, Minn.
H. & D. Div.: W. M. Kellie, *Supt* ...... do.
J. O. Pattie, *M. M* ...... Minneapolis, Minn.
Ia. & Minn. Div.: H. R. Williams, *Supt.* do.
S. Minn. Div.: F. D. Underwood, *Supt.* Lacrosse, Wis.
Riv. & Dub. Divs.: C. W. Case, *Supt.* Dubuque, Ia.
S. Charnley, *M. M* ...... Dubuque, Ia.
Ia. & Da. Div.: G. W. Sanborn, *Supt.* Mason City, Ia.
S. Cy. & Da. Div.: W. J. Underwood, *Supt.* Sioux Cy., Ia.
F. H. Moulton, *M. M* ...... Yankton, Dak.
J. M. Horan, *For* ...... Yankton, Dak.
(3) D. A. Olin, *Asst. Gen. Supt* ...... Racine, Wis.
R. & S. W. Divs.: D. L. Bush, *Supt* ... Racine, Wis.
John Taylor, *M. M* ...... Racine, Wis.
(4) Northern Div.: L. B. Rock, *Supt.* Milwaukee, Wis.
Wm. E. Kittredge, *M. C. B* .. Milwaukee, Wis.
Chicago, Rock Island & Pac. Ry.
4-8½ g. 1,381 m. 309 lo. 8,367 cars.
R. R. Cable, *Pres. & Gen. Man* .... Chicago, Ill.
E. St. John, *Asst. Gen. Man* ...... Chicago, Ill.
A. Kimball, *V. P. & Gen. Supt* ...... Chicago, Ill.
H. F. Royce, *Asst. G. Supt* ...... Davenport, Ia.
F. A. Marsh, *Pur. Agt* ...... Chicago, Ill.
T. B. Twombly, *Gen. M. M* ...... Chicago, Ill.
B. K. Verbryck, *Gen. M. C. B* ...... Chicago, Ill.
Ill. Div.: R. H. Chamberlin, *Supt* ...... Chicago, Ill.
R. Biester, *M. M* ...... Chicago, Ill.
Sam'l Pullman, *M. C. B* ...... Chicago, Ill.
Ia. Divs.: Jno. Given, *Supt* ...... Des Moines, Ia.
J. G. Crockett, *M. M* ...... Stuart, Ia.
Jas. E. Morrill, *M. M* ...... Davenport, Ia.
Chas. M. Leonard, *M. C. B* ...... Davenport, Ia.
K. & Des. M. Div.: Jno. Given, *Supt.* Des Moines, Ia.
S. W. Wakefield, *M. M* ...... Keokuk, Ia.
Henry Kummer, *M. C. B* ...... Keokuk, Ia.
So.-Wn. Div.: G. F. Walker, *Supt* ... Trenton, Mo.
R. O. Carscadin, *M. M* ...... Trenton, Mo.
Chas. R. Best, *M. C. B* ...... Trenton, Mo.
Chicago, Saginaw & Canada R. R. (*See Det., L. & N.*)
Chicago, St. Louis & New Orleans R. R. (*See Ill. Cen.*)
Chicago, St. Louis & Pittsburgh R. R.
4-9 g. 635 m. 202 lo. 3,510 cars.
James McCrea, *Manager* ...... Columbus, O.
Wm. Mullins, *Gen. Pur. Agt* ... Pittsburgh, Pa.
Edward B. Wall, *Supt. M. P* ...... Columbus, O.
1, 3 & 5 Divs.: J. F. Miller, *Supt.* Richmond, Ind.
Robert Curtis, *M. M* ...... Columbus, O.
J. L. Copeland, *G. F. Car Shops.* Columbus, O.
Wm. Swanston, *M. M* ...... Indianapolis, Ind.
W. C. Arp, *Gen. For* ...... Indianapolis, Ind.
2 & 4 Divs.: Chas. Watts, *Supt.* Logansport, Ind.
W. W. Reynolds, *M. M* ...... Logansport, Ind.
Chas. H. Starr, *G. F. C. Shops.* Logansport, Ind.
Chicago, St. Louis & Wn. R. R. 4-8½ g. 152 m. 11 lo. 1,799 c.
F. E. Hinckley, *Gen. Man* ...... Chicago, Ill.
B. T. Lewis, *Pur. Agt* ...... Chicago, Ill.
A. H. Crocker, *Supt* ...... Streator, Ill.
J. N. Chilson, *M. C. B* ...... Streator, Ill.
Chicago, St. Paul, Minneapolis & Omaha Ry.
4-8½ g. 1,301 m. 181 lo. 5,459 cars.
J. M. Whitman, *Gen. Supt* ...... St. Paul, Minn.
W. H. S. Wright, *Pur. Agt* ...... St. Paul, Minn.
Matt. Ellis, *M. M* ...... St. Paul, Minn.
J. J. Ellis, *Asst. M. M* ...... St. Paul, Minn.
H. L. Preston, *M. C. B* ...... Hudson, Wis.
Ea. & No. Div.: A. A. Hobart, *Supt.* St. Paul, Minn.
St. Paul and Sioux City Div.:
H. Spencer, *Supt* ...... St. James, Minn.
H. C. Anderson, *Asst. M. M* ...... Sioux Cy., Ia.
Neb. Div.: Jas. McCabe, *Supt* ...... Omaha, Neb.
Chicago & Alton R. R. 4-8½ g. 849 m. 213 lo. 6,168 c.
C. H. Chappell, *Gen. Man* ...... Chicago, Ill.
T. M. Bates, *Supt. of Trans* ... Bloomington, Ill.
A. V. Hartwell, *Pur. Agt* ...... Chicago, Ill.
Wm. Wilson, *Supt. of Mach* ... Bloomington, Ill.
Jos. Townsend, *G. For. Car Dept.* do.
Chi. Div.: A. M. Richards, *Supt.* Bloomington, Ill.
St. L. & K. C. Div.: S. D. Reeves, *Supt.* Roodhouse, Ill.
Wm. Hill, *M. M* ...... Slater, Mo.
Chicago & Atlantic Ry. 4-8½ g. 269 m.
F. Broughton, *Gen. Man* ...... Chicago, Ill.
J. H. Parsons, *Supt* ...... Chicago, Ill.
C. J. Domville, *M. M* ...... Huntington, Ind.
Chi. & East'n Ill. 4-8½ g. 252 m. 56 lo. 3,870 cars.
O. S. Lyford, *Gen. Supt* ...... Chicago, Ill.
D. R. Patterson, *Pur. Agt* ...... Chicago, Ill.
P. W. Drew, *M. Trans* ...... Chicago, Ill.
Allen Cooke, *M. M* ...... Danville, Ill.
Chicago & Grand Trunk Ry. (*See Grand Trunk.*)
Chicago & Great Southern Ry.
4-8½ g. 124 m. 4 lo. 122 c.
Geo. C. Kimball, *Rec* ...... Attica, Ind.
H. Crawford, Jr., *Supt* ...... Chicago, Ill.
Chicago & Iowa R. R. 4-8½ g. 104 m. 18 lo. 237 cars.
T. J. Potter, *Gen. Man* ...... Chicago, Ill.
H. D. Judson, *Act. Gen. Supt* ...... Rochelle, Ill.
H. S. Bryan, *M. M* ...... Aurora, Ill.
Chicago & Northwestern Ry.
4-8½ g. 3,843 m. 672 lo. 21,054 cars.
Marvin Hughitt, *2d V. Prs. & G. M.* Chicago, Ill.
C. C. Wheeler, *Gen. Supt* ...... Chicago, Ill.
R. H. McCullough, *Ass't Gen. Supt.* Chicago, Ill.
R. W. Hamer, *Pur. Agt* ...... Chicago, Ill.
Geo. W. Tilton, *Supt. M. P. & M.;* and
W. A. Scott, *A. Supt. M. P. & M* .. Chicago, Ill.
Wis. Div.: Ed. J. Cuyler, *Supt* ...... Chicago, Ill.
Gal. Div.: Chas. Murray, *Supt* ...... Chicago, Ill.
Pen'a Div.: W. F. Fitch, *Supt* ...... Escanaba, Mich.
J. Symons, *M. M* ...... Escanaba, Mich.
Mad. Div.: C. A. Swineford, *Supt.* Baraboo, Wis.
H. D. Page, *M. M* ...... Baraboo, Wis.
Minn. & Dak. Divs.: S. Sanborn, *Asst. Gen. Supt.*
Wis., St. P. & Dak. Div.:
Wm. Smith, *M. M* ...... Winona, Minn.
Dak. Cen. Ry.: J. S. Oliver, *Supt* ... Huron, Dak.
Ia. Div.: H. G. Burt, *Supt* ...... Boone, Ia.
Robt. Quayle, *Act. M. M* ...... Clinton, Ia.
No. Ia. Div.: M. Hopkins, *Supt* ... Eagle Grove, Ia.
Win. & St. P. Div.:
W. P. Cosgrave, *Supt* ...... Winona, Minn.
Wm. Smith, *M. M* ...... Winona, Minn.
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4-8½ g. 409 m. 47 lo. 1,629 cars.
J. B. Mulliken, *V. P. & G. Man.* Muskegon, Mich.
J. K. V. Agnew, *Gen. Supt.* Grand Rapids, Mich.
Allen Bourne, *Pur. Agt* ...... Detroit, Mich.
W. F. N. Davis, *M. M* ...... Muskegon, Mich.
Chicago & West'n Ind. R. R. 4-8½ g. 50 m. 12 lo. 150 c.
James D. Carson, *Gen. Man* ...... Chicago, Ill.
R. W. Johnson, *M. M* ...... Chicago, Ill.
Cincinnati, Columbus & Hocking Val. Ry.
4-9 g. 25 m. 2 lo. 77 cars.
D. P. Hyatt, *Gen. Man* ...... Dayton, O.
Cin., Georgetown & Portsmouth. 3 g. 35 m. 3 lo. 45 c.
M. Simmons, *Supt* ...... Cincinnati, O.
F. Enler, *M. M* ...... Cincinnati, O.
Cincinnati & Green River Ry. 5 g. 17 m. 2 lo. 50 c.
G. B. Harper, *Supt* ...... Yosemite, Ky.
F. S. Biggs, *M. M* ...... Yosemite, Ky.
Cin., Hamilton & Dayton R. R. 4-9 g. 352 m. 92 l. 2,932 c.
W. F. Stark, *Asst. Supt* ...... Cincinnati, O.
John Black, *Gen. M. M* ...... Lima, O.
W. H. H. Allison, *M. C. B* ...... Cincinnati, O.
Cincinnati, Hamilton & Indianapolis R. R.
4-8½ g. 98 m.
C. J. Hepburn, *Supt* ...... Cincinnati, O.
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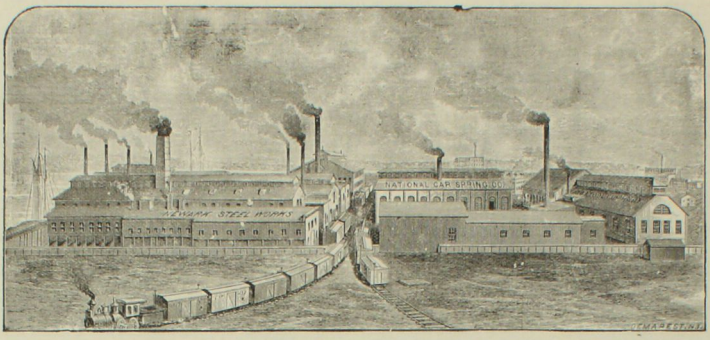

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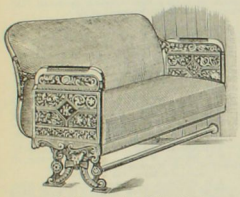

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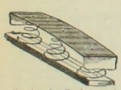

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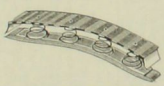

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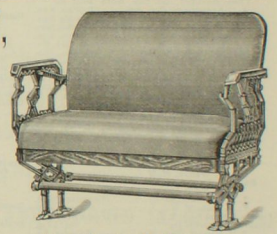

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After many experimental trials I have succeeded in accomplishing much toward increasing the durability of colors, and lessening the extravagant waste which has long attended the present system of outside painting. And in order to prove beyond a doubt the great value of my discovery, I waited FIVE YEARS in order to test its utility. Before announcing it publicly, I selected my own House and Stable—which had been painted five years previous—had the paint washed clean, and then put on one coat of the MARINE VARNISH, which *gave it an excellent gloss and restored the old Paint to its original color, freshness and appearance of new paint.* So perfect is the resemblance that it is difficult to convince those who are ignorant of the fact, that it has not been repainted.

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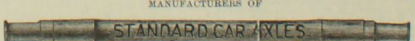

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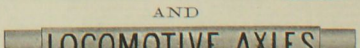

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J. S. Patterson, M. of Mach. & M. C. B. Cincinn., O
Cincinnati, New Orleans & Texas Pacific Ry. Co.
5 g. 846 m. 123 lo. 3,464 cars.
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M. M. ....Vicksburg, Miss.
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H. L. Wright, Pur. Agt. ....Selma, Ala.
J. M. Levis, M. M. ....Marion, Ala.
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4-9 g. 94 m. 8 lo. 168 cars.
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Cin., Wabash & Mich. Ry. 4-8½ g. 165 m. 13 lo. 402 c.
Norman Beckley, Gen. Man. & P. A. Elkhart, Ind.
O. W. Lamport, Supt. ....Wabash, Ind.
S. B. Tinker, M. M. & M. C. B. ...Wabash, Ind
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Jas. H. Stewart, Gen. Man. ....Cincinnati, O.
Edw. Evans, M. M. ....Chillicothe, O.
T. G. Duncan, Supt. Car Dept. ......Zaleski, O.
Cincinnati, Wheeling & New York R.R. 4-8½ g. 13 m.
T. M. Atkinson, Gen. Man. ....Batesville, O.
Cincinnati & Eastern Ry. 3 g. 68 m. 6 lo. 133 cars.
4-8½ g. 50 m. 3 lo.
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G. H. Wilber, Gen. Sup. & Pur. Agt. Cincinnati, O.
A. Donaldson, M. M. ....Newtown, O.
P. W. Naughton, M. M. ....Batavia, O.
Cincinnati & South-Eastern Ry. 4-8½ g. 18 m.
John V. Patton, Gen. Man. ....Newport, Ky.
Clarksburg, Weston & Glenville R. R.
3 g. 26 m. 3 lo. 45 cars.
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Sam. A. Steel, M. M. ....Weston, W. Va.
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4-8½ g. 785 m. 246 lo. 7,988 cars.
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Day. & Un. Rd.: J. H. Barrett, Supt. ..Dayton, O.
H. S. Gordon, For. M. Shops ......Dayton, O.
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I. H. Burgoon, Gen. Man. ....Delphos, O.
B. F. Marshall, M. M. ....Delphos, O.
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4-8½ g. 19 m. 2 lo. 20 cars.
J. A. Larned, Rec. & Supt. .....Anderson, Ind.
Cleveland, Mt. Vernon & Delaware R. R.
4-9 g. 144 m. 24 lo. 886 c.
N. Monsarrat, Gen. Supt. ....Akron, O.
G. M. Taylor, M. M. & C. B. ....Mt. Vernon, O.
Cleve., Youngstown & Pitts. R. R. 3 g. 30 m. 3 lo. 138 c.
D. T. Lumley, Gen. Supt. ....Alliance, O.
C. H. Dorman, M. M. & M. C. B. ...Alliance, O.
Cleveland, Lorain & Wheeling Ry.
4-8½ g. 158 m. 31 lo. 1,878 cars.
Oscar Townsend, Gen. Man. ......Cleveland, O.
Wm. Thornburg, Supt. ....Lorain, O.
C. H. Waburton, M. M. ....Lorain, O.
A. Warburton, Gen. For. ....Lorain, O.
Cleveland & Canton R. R.
3 g. 160 m. 26 lo. 1,036 cars.
Samuel Briggs, Gen. Man. ......Cleveland, O.
John Bean, M. M. ....Canton, O
Cleve. & Marietta R. R. (See Wheel. & Lake Erie.)
Cleveland & Pittsburgh. (See Penna. Co.; (4) Div.)
Clifton & Port Hudson R. R. 4-8½ g. 22 m. 3 lo. 12 c.
John Bradley, Supt. ....New Orleans, La.
W. F. Lockwood, M. M. ....Clinton, La.
E. D. Anderson, M. M. ....Vicksburg, Miss.
Clove Branch R. R. 4-8½ g. 8 m. 1 lo. 61 cars.
C. L. Kimball, Supt. ......Matteawan, N. Y.
W. G. Vanbuskirk, M. M. ...Dutchess Jc., N. Y.
Coburg, Peterborough & Marmora Ry.
5-6 g. 47 m. 5 lo. 255 cars.
Jas. R. Barber, Gen. Supt. ....Cobourg, Ont.
Jas. Clark, M. M. ....Cobourg, Ont
John Tinney, M. C. B. ....Cobourg, Ont.
Colorado Central R. R. (See Un. Pac.; (4) Div.)
Columbia & Greenville R. R. (See Rich. & D.; (3) Div.)
Columbia & Puget Sound R.R. 3 g. 21 m. 7 lo. 114 c.
J. L. Howard, Gen. Supt. .San Francisco, Cal.
Columbus, Hocking Valley & Toledo Ry.
4-9 g. 324 m. 90 lo. 7,353 cars.
G. R. Carr, Gen. Supt. ....Columbus, O
W. M. Greene, Pur. Agt. ....Columbus, O.
Ira G. Hutchins, M. M. ....Columbus, O.
J. M. Rockafield, M. C. B. ....Columbus, O.
Tol. Div.: M. T. Seymour, Supt. .....Columbus, O.
Hock. V. Div.: M. P. L. Booth, Supt. Columbus, O.
Ohio Riv. Div.: C. D. Norris, Supt. ......Logan, O.
Columbus & Eastern R. R. in progress
J. E. Redfield, Pres. ....Columbus, Ohio.
Columbus & Maysville Ry. (See Cin. & East.)
Columbus & Rome R. R. 3 g. 33 m. 3 lo. 30 cars.
M. E. Gray, Supt. ....Columbus, Ga.
Columbus & Western Ry. 5 g. 89 m. 6 lo. 53 cars
E. A. Flewellen, Gen. Man. ...Columbus, Ga.
R. A. Bridges, M. M. ....Opelika, Ala
Concord R. R. 4-8½ g. 141 m. 41 lo. 1,264 cars
H. E. Chamberlin, Supt. & P. Agt. Concord, N. H
J. T. Gordon, M. M. & C. B. .Concord, N. H
Concord & Claremont R. R. (See Northern of N. H.
Conn. Riv. and Ver. Val. R. Rs. 4-8½ g. 130 m. 42 lo. 554 c.
J. Mulligan, Supt. & Pur. Agt. Springfield, Mass.
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Conn. & Passumpsic Rivers R. R. (See Passumpsic)
Cooperstown & Susquehanna Valley R. R.
4-8½ g. 16 m. 2 lo. 14 cars.
Andrew Shaw, Pres. ....Cooperstown, N. Y.
A. Mumford, M. M. ....Cooperstown, N. Y.
Corning, Cowanesque & Antrim Ry.
(See F. Br. Coal Co.)
Cornwall R. R., 4-8½ g. 12 m. 5 lo. 166 cars
J. M. Havard, G. Supt. & M. M. ...Lebanon, Pa.
Levi Bloch, M. C. B. ....Lebanon, Pa.
Cornwall & Lebanon R. R. 4-9 g. 5 m.
J. C. Jennings, Supt. ....Lebanon, Pa.
Coudersport & Port Allegheny R. R.
3 g. 17 m. 2 lo. 64 cars.
B. A. McClure, Gen. Supt. ....Coudersport, Pa.
Credit Valley Ry. 4-8½ g. 184 m. 22 lo. 535 cars.
Wm. Whyte, Gen. Supt. ....Toronto, Ont.
John Macnab, Pur. Agt. ....Toronto, Can.
D. Preston, Mech. Supt. ....Toronto, Can.
Crescent Springs Ry. 3 g. 12 m. 2 lo. 50 c.
David Joyce, Gen. Man. ....Lyons, Ga.
W. R. Bourm, Asst. Gen. Man. Shell Lake, Wis.
John Devereaux, Gen. Supt. ..Shell Lake, Wis.
C. I. Wickersham, Pur. Agt. ......Chicago, Ill.
Ira Wood, Supt. M. P. & M. ..Shell Lake, Wis.
John Blackburn, M. C. B. ....Shell Lake, Wis.
Crooked Creek R. R. 3 g. 9 m. 1 lo. 37 cars.
Walter C. Willson, Gen. Man. Webster City, Ia

Geo. W. Post, Pur. Agt. ....Lehigh, Ia.
Crown Point Iron Co.'s R. R. 3 g. 13 m. 3 lo. 135 c.
A. L. Inman, Gen. Man. .....Plattsburg, N. Y.
H. L. Reed, Pur. Agt. ......Crown Point, N. Y.
Jas. McMann, Supt. ....Crown Point, N. Y.
C. W. Sanders, M. M. ......Crown Point, N. Y.
Cumberland Ry. 4-8½ g. 32 m. 1 lo. 64 c.
J. A. Killam, Gen. Man. ....Parsboro, N. S.
K. McKinnon, M. M. ....Parsboro, N. S.
Cumberland Valley R. R. 4-9 g. 127 m. 25 lo. 474 cars.
J. F. Boyd, Supt. ....Chambersburg, Pa.
A. S. Hull, M. M. ....Chambersburg, Pa.
C. Wicke, M. C. B. ....Chambersburg, Pa.
Cumberland & Maurice River R. R. 4-8½ g. 20 m.
L. H. Dowdney, Supt. ......Port Norris, N. J.
Cumberland & Penn. R. R. 4-8½ g. 55 m. 28 lo. 625 c.
P. L. Burwell, Gen. Supt. & P. A. Cumberland, Md.
N. W. Howson, Mast. of Mach. Mt. Savage, Md.
Nathan Binix, M. C. B. ....Mt. Savage, Md.

D

Danville & New River R. R. 3 g. 43 m. 2 lo. 30 c.
W. T. Sutherlin, Gen. Man. ....Danville, Va.
W. T. Whittaker, M. M. ....Danville, Va.
Danbury & Norwalk R. R. 4-8½ g. 36 m. 7 lo. 112 c.
C. M. Crawford, G. Supt. & P. A. S. Norwalk, Ct.
W. H. Wilkinson, M. M. & C. B. Danbury, Conn.
Danville, Mocksville & So.-Wn. R. R. 3 g. 28 m.
H. M. Shivler, Supt. ....Leakesville, N. C.
Danville, Olney & O. R. R.R. 4-8½ g. 78 m. 3 lo. 34 c.
C. E. Henderson, Rec. & Man. ....Olney, Ill.
W. A. Bell, M. M. & C. B. ....Kansas, Ill
Dayton & Toledo R. R. 3 g. 96 m.
C. E. Henderson, Gen. Man. ....Dayton, O.
J. E. Gimperling, Supt. ....Dayton, O.
Dayton & Union R. R. (See Clev., Col., Cin. & Ind.)
Dayton & Michigan R. R. (See Cin., Ham. & Day.)
Dayton & Ironton R. R.
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H. C. Norton, Pur. Agt. ...Indianapolis, Ind.
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4-8½ g. 930 m. 436 lo. 31,989 cars.
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A. Reasoner, Supt. ....Hoboken, N. J.
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J. W. Baker, Mast. Car Rep. ....Dover, N. J.
Oswego & Syracuse Div.:
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4-8½ g. 81 m. 20 lo. 598 cars.
W. K. Niver, Gen. Supt. ......Syracuse, N. Y.
Jas. Buchanan, M. M. ....Syracuse, N. Y.
Cayuga Div.: Supt. Ithaca, N. Y.
Buffalo Div.: T. B. Griffith, M. M. Buffalo, N. Y.
Delaware, Maryland & Virginia R. R.
4-8½ g. 101 m. 7 lo. 145 cars.
Tho. Groom, Supt. ....Lewes, Del.
Geo. Messick, M. M. ....Lewes, Del.
W. H. Virden, M. C. B. ....Lewes, Del.
Delaware River R. R. 4-8½ g. 20 m. 3 lo. 8 cars.
E. H. Green, Supt. ....Pedricktown, N. J.
Delaware & Hudson Canal Co.
4-3 and 4-8½ g. 634 m. 180 lo. 10,799 cars.
C. F. Young, Pres. & Gen. Man. Honesdale, Pa.
H. G. Young, Asst. Gen. Man. ...Honesdale, Pa.
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R. C. Blackall, Supt. of Mach. ....Albany, N. Y.
Susq. Div.: C. D. Hammond, Supt. Albany, N. Y.
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J. R. Skinner, M. C. B. ....Oneonta, N. Y.
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J. L. Corey, M. M. ....Green Island, N. Y.
Chr. Körner, M. C. B. ...Green Island, N. Y.
Pa. Div.: R. Manville, Supt. & Pur. Agt. and
S. H. Dotterer, M. M. ....Carbondale, Pa.
T. Orchard, M. C. B. ....Carbondale, Pa.
Denver Circle R. R. 3 g. 12 m. 7 lo. 15 cars
Theo. C. Henry, Gen. Man. ....Denver, Col.
W. B. Sprague, Gen. Supt. ....Denver, Col.
Denver, Utah & Pacific R. R. 3 g. 34 m. 4 lo. 171 c.
L. M. Fouts, Supt. ....Denver, Col.
Denver & New Orleans. 4-8½ g. 140 m. 11 lo. 400 c.
C. W. Fisher, Gen. Man. ....Denver, Col.
Chas. Wheeler, Pur. Agt. ....Denver, Col.
J. H. Kirk, M. M. & M. C. B. .....Denver, Col.
Denver & Rio Grande Ry. 3 g. 1,317 m. 222 lo. 5,932 c.
W. S. Jackson, Rec. ....Denver, Col.
C. M. Hobbs, Pur. Agt. ....Denver, Col.
N. W. Sample, Supt. M. P. & M. ...Denver, Col.
(1) Col. & N. M. Div.: R. E. Ricker, G. S. Denver, Col
1st Div.: W. W. Borst, Supt. ....S. Pueblo, Col.
2d Div.: Cole Lydon, Supt. ....Alamosa, Col.
3d Div.: G. W. Cook, Supt. ....Leadville, Col.
4th Div.: R. M. Ridgway, Supt. ......Salida, Col.
Denver, Rio Grande & Western Ry. 3 g. 369 m.
W. H. Bancroft, Rec. & Gen. Supt.,
Salt Lake City, Utah.
A. L. Horner, Ass't Supt. Salt Lake City, Utah.
S. C. Smith, M. M. ....Salt Lake City, Utah.
Des Moines, Osceola & Southern R. R.
3 g. 100 m. 7 lo. 253 cars
Jas. Donahue, Supt. ....Des Moines, Ia.
Wm. Persing, M. M. ....Osceola, Ia.
Elias Tonet, M. C. B. ....Osceola, Ia.
Des Moines & Ft. Dodge. 4-8½ g. 144 m. 13 lo. 350 c.
C. N. Gilmore, Supt. ....Des Moines, Ia.
John McGrayel, M. M. ......Grand Junction, Ia.
E. A. Avery, M. C. B. ....Grand Junction, Ia.
Det., Bay City & Alpena R. R. 3-2 g. 48 m. 5 lo. 227 c.
Milo Eastman, Supt. ....East Tawas, Mich.
Det., Lansing & No'n R. R. 4-8½ g. 222 m. 84 lo. 1027 c
John B. Mulliken, Gen. Man. ......Detroit, Mich.
Allan Bourn, Pur. Agt. ....Detroit, Mich.
Thos. M. Fish, Gen. Supt. ....Ionia, Mich.
G. C. Watrous, M. M. & C. B. ....Ionia, Mich.
Det., Mack. & Marq. R. R. 4-8½ g. 152 m. 16 lo. 1,112 c.
Gen. Supt. ....Marquette, Mich.
W. J. Tench, Pur. Agt. ....Marquette, Mich.
John B. Wilson, Mech. Supt. ....Marquette, Mich.
Dorchester & Delaware R. R. (See Penna. (4) Del. Div.)
Dubuque & Dakota R. R. 4-8½ g. 64 m. 2 lo. 54 cars.
A. C. Goodrich, Supt. ....Hampton, Ia.
W. S. Couch, Pur. Agt. ....Dubuque, Ia.
Duck River Valley R. R. (See Nash., Chat. & St. L.)
Dunkirk, Allegheny Valley & Pittsburgh R. R.
4-8½ g. 91 m. 14 lo. 102 cars.
D. Thayer, Gen. Supt. ....Dunkirk, N. Y.
R. C. Moore, Pur. Agt. ....New York, N. Y.
J. C. Haggett, M. M. & C. B. .....Dunkirk, N. Y.

E

East Alabama Ry. 5 g. 22 m. 3 lo. 19 cars.
W. W. Barnes, Supt. ....Opelika, Ala.
East Broad Top R. R. 3 g. 30 m. 7 lo. 260 cars.
A. W. Sims, Supt. ....Orbisonia, Pa.
A. W. Greenwood, M. M. ....Orbisonia, Pa.
East St. Louis & Carondelet Ry. 4-9 g. 4 lo. 27 c.
Joseph Hill, Gen. Supt. ......East St. Louis, Ill.
East Tenn. & Western North Car. R. R.
3 g. 34 m. 3 lo. 73 cars.
Thomas E. Matson, Supt. Elizabethton, Tenn.
East Tennessee, Virginia & Georgia R. R.
5 g. 1,453 m. 166 lo. 3,670 cars.
Henry Fink, Rec. ....Knoxville, Tenn.
C. H. Hudson, Gen. Man. ......Knoxville, Tenn.
J. F. O'Brien, Asst. Gen. Man. Knoxville, Tenn.
J. E. Wilcox, Pur. Agt. ....Knoxville, Tenn.
East Tenn. Div. and No. Car. and Ohio Branches.
F. K. Huger, Supt. ....Knoxville, Tenn.
B. J. Sitton, M. M. ....Knoxville, Tenn.
Jos. Armbruster, M. C. B. ....Knoxville, Tenn.
Alabama Div.: J. M. Bridges, Supt. ..Selma, Ala.
Simon Gay, M. M. ....Selma, Ala.
W. W. Pierce, M. C. B. ....Selma, Ala.
Memphis & Charleston R. R. (Div.):
R. B. Pegram, Jr., Supt. ......Memphis, Tenn
H. N. Burford, M. M. ....Memphis, Tenn
Georgia Div.: J. W. Fry, Supt. ......Atlanta, Ga
J. E. Mallory, Ass't Supt. ....Macon, Ga.
W. A. Walden, M. M. ....Atlanta, Ga.
J. H. Perkins, M. C. B. ....Atlanta, Ga.

East & West R. R. of Ala. 3 g. 110 m. 9 lo. 85 c.
T. J. Nicholl, Manager ....Cedartown, Ga.
C. F. West, M. M. & C. B. ......Cedartown, Ga.
Eastern R. R. 4-8½ g. 283 m. 110 lo. 2,268 cars.
Payson Tucker, Gen. Man. ....Boston, Mass.
D. W. Sanborn, Mast. of Trans. ..Boston, Mass.
G. F. Hurd, Pur. Agt. ....Boston, Mass.
Amos Pilsbury, S. M. P. & M. ..E. Boston, Mass.
A. M. Waitt, G. For. Car Dept. ....Salem, Mass.
Con'y Div.: J. W. Sanborn, Supt., Wolfboro J., N. H.
Eastern Kentucky R. R. 4-8½ g. 34 m. 5 lo. 160 c.
H. W. Bates, Man. & Pur. Agt. ...Riverton, Ky.
H. W. Crawford, M. M. ....Hunnewell, Ky.
Eastern (Maine) R. R. (See Maine Central.)
Eastern Shore R. R. 4-8½ g. 38 m. 3 lo. 9 c.
W. Thompson, Supt. ....Princess Anne, Md.
F. Strattner, M. M. ....Princess Anne, Md.
Elmira, Cortland & Northern R. R. 4-8½ g.
A. A. McLeod, Gen. Man. ....Elmira, N. Y.
Edw. Mahler, Pur. Agt. ....Elmira, N. Y.
Thos Kearsley, M. M. & M. C. B. Cortland, N. Y.
Erie & Huron Ry. 4-8½ g. 40 m.
E. O. Bickford, Gen. Man. ....Toronto, Ont.
Erie & Pittsburg R. R. (See Penna. Co.; (3) Div.)
Etowah & Deaton's R. R. 3 g. 9 m.
D. M. Rogers, Gen. Man. ....Etowah, Ga.
Eureka Springs Ry. 4-8½ g. 19 m. 1 lo. 9 cars.
Powell Clayton, Gen. Man. Eureka Springs, Ark.
Eureka & Palisade R. R. 3 g. 97 m. 7 lo. 125 cars.
B. Gilman, Gen. Supt. & Pur. Agt. Eureka, Nev.
J. M. Crawford, M. M. ....Palisade, Nev.
A. S. Longley, M. C. B. ....Palisade, Nev.
European & North American R. R. (See Maine Cen.)
Evansville, Rockport & E'n Ry. 4-9 g. 71 m. 5 lo. 98 c
H. L. Shepard, Supt. ....Evansville, Ind.
Evansv. & Terre Haute. 4-8½ g. 169 m. 26 lo. 973 c.
D. J. Mackey, Gen. Supt. ......Evansville, Ind.
John Torrance, M. M. ....Evansville, Ind.

F

Fall Brook Coal Co. 4-8½ g. 250 m. 60 lo. 2,006 c.
Pine Creek Ry; Corning, Cowanesque & Antrim; Cowansque Br.: Syracuse, Geneva & Corning; Geneva & Lyons; and New York & Penn Yan.
A. H. Gorton, Gen. Supt. ....Corning, N. Y.
G. R. Brown, Asst. Supt. ....Corning, N. Y.
W. H. Chaphe, Pur. Agt. ....Corning, N. Y.
Wm. A. Foster, Supt. R. S. & Mach. Corning, N. Y.
C. J. Butter, M. C. B. ....Corning, N. Y.
Fitchburg R. R., 4-8½ g. 152 m. 100 lo. 3,566 cars.
John Adams, Gen. Supt. ....Boston, Mass.
F. S. Pratt, Pur. Agt. ....Boston, Mass.
Orlando Stewart, Supt. M. P. ......Boston, Mass.
J. W. Marden, Supt. C. Dept. Charlestown, Mass.
Flint & Pere Marq. 4-8½ g. 346 m. 78 lo. 2,664 cars
H. C. Potter, Gen. Man. .....E. Saginaw, Mich.
D. Edwards, Asst. Gen. Man. .E. Saginaw, Mich
G. G. Cook, Pur. Agt. ....E. Saginaw, Mich.
Sanford Keeler, Gen. Supt. ..E. Saginaw, Mich.
W. F. Potter, Supt. (E. Div.) ..E. Saginaw, Mich
W. F. Potter, Supt. (W. Div.) ..E. Saginaw, Mich.
T. J. Hatswell, M. M. ....E. Saginaw, Mich.
H. M. Perry, M. C. B. ....E. Saginaw, Mich.
Florida Ry. & Nav. Co. 5 g. 488 m. 31 lo. 397 c.
D. E. Maxwell, Gen. Supt. ....Fernandina, Fla.
R. V. Dohoney, M. M. & C. B. Fernandina, Fla.
Florida Southern Ry. 3 g. 159 m. 17 lo. 155 cars.
Sherman Conant, Gen. Man. ......Palatka, Fla.
Jas. D. Hollister, Supt. & P. Agt. ..Palatka, Fla.
St. J. & L. Eustis Div.: 50 m.
W. J. Jarvis, Supt. ....Ft. Mason, Fla.
W. B. Denham, Asst. Supt. ...Ft. Mason, Fla.
W. M. Rutherford, M. M. ....Ft. Mason, Fla.
Fonda, Johnst'n & Gloversv. 4-8½ g. 26 m. 5 lo. 35 c.
Lawton Caten, Supt. ....Gloversville, N. Y.
G. V. Putman, M. M. ....Gloversville, N. Y.
Fond du Lac, Amboy & Peoria. 3 g. 30 m. 2 lo. 35 c.
Alonzo Kinyon, Supt. & P. A. Fond du Lac, Wis.
Fort Dodge & Fort Ridley R. R. (See Minn. & St. L.)
Franklin & Prov. & Hopkinton. 22 m.
E. T. Logee, Supt. ....Milford, Mass.
Ft. Madison & No.-West'n Ry. 3 g. 45 m. 4 lo. 121 c.
S. B. Kenrick, Rec. & Pur. Agt. Ft. Madison, Ia
I. L. Lamb, M. M. & C. B. ....Ft. Madison, Ia.
Ft. Wayne, Cin. & Louisv. 4-8½ g. 128 m. 10 lo. 250 c.
White Water R. R. 4-8½ g. 65 m. 5 lo. 170 cars.
W. W. Worthington, Gen. Supt. ..Ft. Wayne, Ind.
T. H. Haberkorn, M. M. ....Ft. Wayne, Ind.
Wm. Knight, M. C. B. ....Ft. Wayne, Ind.
Ft. Worth & Denver City Ry. 4-8½ g. 114 m. 8 lo. 443 c.
C. L. Frost, Gen. Supt. ....Fort Worth, Tex.
Freehold & New York Ry. 4-8½ g. 15 m. 4 lo. 40 c.
J. E. Ralph, Supt. & Pur. Agt. Freehold, N. J.
M. C. Mooney, M. M. ....Freehold, N. J.
C. H. Snedeker, M. C. B. ....Freehold, N. J.
Fulton County N. G. Ry. 3 g. 61 m. 4 lo. 168 cars.
A. C. Atherton, Gen. Supt. & P. Agt. Lewiston, Ill.

G

Gainesville & Dahlonega R. R. 3 g. 15 m.
W. P. Price, Pres. ....Dahlonega, Ga.
Gainesville, Jefferson & Southern R. R. (See Cen. of Ga)
Gal., Harrisburg & San Antonio Ry. (See Cen. Pac.)
Galveston, Houston & Hend. R. R. (See Mo. Pac. (5) Div.)
Galveston, Sabine & St. Louis Ry.
4-8½ g. 28 m. 2 lo. 33 cars
Brad. Barner, Gen. Man. ....Longview, Tex.
Chas. H. Jewell, Gen. Supt. .....Longview, Tex.
Geneva, Ithaca & Sayre R. R. (See Lehigh Val.)
George's Creek & Cumberland R. R.
4-9 g. 25 m. 6 lo. 212 cars.
J. A. Millholland, Gen. Man. .Cumberland, Md.
Georgetown & Lane's R. R. 5 g. 36 m. 2 lo. 52 c.
G. W. Earle, Gen. Supt. ......Georgetown, S. C
Georgia R. R. 5 g. 307 m. 42 lo. 1,048 cars.
John W. Green, Gen. Man. ....Augusta, Ga.
John S. Cook, M. M. ....Augusta, Ga.
T. M. Preval, M. C. B. ....Augusta, Ga.
Georgia Pacific Ry. 5 g. 218 m.
I. Y. Sage, Gen. Supt. ....Birmingham, Ala.
S. H. Purcell, Div. Supt. ......Greenville, Miss.
G. H. Barnum, Div. Supt. ....Columbus, Miss.
Gettysburg & Harrisburg R. R. 4-9 g. 21 m.
W. H. Woodward, Supt. Pine Grove Furnace, Pa.
G'd Rap., Newaygo & L. S. R. R. (See Chic. & W. M.)
Grand Rapids & Indiana. 4-9 g. 528 m. 56 lo. 2,083 c.
W. O. Hughart, Gen. Man. Grand Rapids, Mich.
W. R. Shelby, Pur. Agt. ....Grand Rapids, Mich.
S. D. Bradley, M. M. ....Grand Rapids, Mich.
No'n Div.: J. M. Metheany, Supt. G'nd Rap., Mich.
So'n Div.: P. S. O'Rourke, Supt. Fort Wayne, Ind.
Grand Southern Ry. of New Brunswick.
4-8½ g. 82 m. 5 lo. 54 cars.
J. N. Greene, Gen. Man. ....St. George, N. B.
F. W. Holt, Supt. ....St. George, N. B.
Thomas Logan, M. M. ....St. George, N. B.
Grand Tower & Carbondale. 4-8½ g. 25 m. 6 lo. 357 c.
J. C. Simpson, Supt. ....Carbondale, Ill.
Hugh Smith, M. M. ....Murphysboro, Ill.
O. L. Garrison, Pur. Agt. ....St. Louis, Mo.
Grand Trunk Ry. 4-8½ g. 2,332 m. 660 lo. 16,330 c.
Joseph Hickson, Gen. Man. ....Montreal, Can.
Wm. Wainright, Asst. Gen. Man. Montreal, Can.
Jno. Taylor, Gen. Storekeeper ...Montreal, Can.
Herbert Wallis, Mech. Supt. ......Montreal, Can.
Wm. McWood, Supt. Car Dept. ...Montreal, Can.
J. Harkom, Ass. Mech. Supt. ..Richmond, P. Q.
A. H. Smith, Ass. Mech. Supt. ....Toronto, Ont.
R. Boaz, Asst. Mech. Supt. ....Stratford, Ont.
F. L. Wanklyn, Loco. Works ......Montreal, Can.
Gt. West'n Div.: Chas. Stiff, Supt. Hamilton, Ont.
E. Baines, Store Kpr. ....London, Ont.
C. K. Domville, Mech. Supt. ....Hamilton, Ont.
E. Mavor, Asst. Mch. Supt. ....Hamilton, Ont.
J. D. McIlwain, Asst. Car Dept. ..London, Ont.
Chi. & Gr. Trunk Ry. 4-8½ g. 330 m. 103 lo. 1,191 c.
W. J. Spicer, Gen. Man. ....Detroit, Mich.
A. B. Atwater, Supt. ....Battle Creek, Mich.
J. F. Lorimer, Storekeeper ....Detroit, Mich.
H. Roberts, Mech. Supt. ....Detroit, Mich.
Midland of Can. 4-8½ g. 471 m. 44 lo. 1,423 c.
W. B. Ferguson, Supt. ....Peterboro, Ont.
J. D. Barnet, Mech. Supt. ......Port Hope, Ont.
Det., Gr. H. & Mil. Ry. 4-8½ g. 189 m. 39 lo. 606 c.
W. J. Spicer, Gen. Man. ....Detroit, Mich.
John S. Lorimer, Storekeeper ....Detroit, Mich.
W. J. Morgan, Supt. ....Detroit, Mich.
H. Roberts, Mech. Supt. ......Port Huron, Mich.

Green Bay, Winona & St. Paul R. R.
4-8½ g. 250 m. 19 lo. 623 cars.
G. Campbell, Gen. Man. & P. A. Green Bay, Wis.
A. Fenwick, M. M. ....Ft. Howard, Wis.
Green Cove Spring & Melrose R.R. 3 g. 32 m. 1 lo. 11 c.
S. Ackley, Pres. ....Philadelphia, Pa.
Greenwood, Laurens & Spart'g. 5 g. 4 lo.
J. N. Bass, Supt. ....Augusta, Ga.
T. F. Warwick, M. M. & M. C. B. Augusta, Ga.
Greenwich & Johnsonville Ry. 4-8½ g. 15 m. 1 lo. 7 c.
J. H. Thompson, Supt. ....Greenwich, N. Y.
Gulf, Col. & Santa Fé Ry. 4-8½ g. 536 m. 51 lo. 1,400 c.
Webster Snyder, Gen. Man. ..Galveston, Texas.
Jno. W. Thorne, Pur. Agt. ....Galveston, Texas.
W. H. Reilly, M. M. & M. C. B. Galveston, Texas.
Gulf, W'n Texas & Pac. Ry. 4-8½ g. 68 m. 6 lo. 74 c.
M. D. Monserrate, Supt. & Pur. Agt. Cuero, Tex.
James Mooney, M. M. ....Cuero, Texas.

H

Hannibal & St. Jo. R. R. 4-8½ g. 292 m. 76 lo. 1,906 c.
J. F. Barnard, Gen. Man. ......St. Joseph, Mo.
S. E. Cranco, Gen. Supt. ....Hannibal, Mo.
Wm. Irving, Pur. Agt. ....Chicago, Ill
N. J. Paradise, Supt. M. M. ......Hannibal, Mo.
G. M. Shryock, M. C. B. ....Hannibal, Mo.
Hanover Branch R. R. 4-8½ g. 8 m. 2 lo. 18 cars
E. Y. Perry, Supt. ....South Hanover, Mass
Hanover Junction, Hanover & Gettysburg R. R.
4-8½ g. 74 m. 10 lo. 140 cars.
H. D. Scott, Gen. Supt. ....Gettysburg, Pa.
John J. Bingley, M. M. ....Hanover, Pa.
Jas. Harthorn, M. C. B. ....Hanover, Pa.
Harrisburg & Potomac R. R. 4-8½ g. 41 m. 3 lo. 45 c.
R. H. Middleton, Supt. .....Boiling Springs, Pa.
Hartford & Conn. Val. R. R. 4-8½ g. 47 m. 9 lo. 196 c.
O. M. Shepard, Supt. ....New Haven, Ct.
John Henry, Jr., Supt. M. P. ..Hartford, Conn.
Hartford & Conn. W'n R. R. 4-8½ g. 110 m. 16 lo. 495 c.
Edw. McNeil, Supt. ....Hartford, Ct.
J. C. Barton, M. M. ....Hartford, Ct.
Hecla & Torch Lake R. R. 4-1 g. 5 m. 5 lo. 165 cars.
W. A. Childs, Gen. Man. ....Calumet, Mich.
Herkimer, Newport & Poland Ry.
3-6 g. 17 m. 2 lo. 24 cars.
Albert Wilber, Supt. ....Herkimer, N. Y.
Hobart & Manistee River R. R. 3 g. 9 m. 2 lo. 42 c.
H. W. Marsh, Supt. ....Hobart, Mich.
Hot Springs R. R. 3 g. 25 m. 3 lo. 39 cars.
J. N. Conger, Supt. ....Hot Springs, Ark.
L. Finlay, M. M. ....Malvern, Ark.
Housatonic R. R. 4-8½ g. 126 m. 23 lo. 879 cars.
W. H. Yeomans, Supt. ....Bridgeport, Ct.
D. S. Draper, Pur. Agt. ....Bridgeport, Ct.
N. Slingland, M. M. ....Falls Village, Ct.
J. J. Ferris, M. C. B. ....Falls Village, Ct.
Houston Belt Ry. 4-8½ and 3 gauge 16 miles.
S. L. Werden, V. P. & Gen. Man. Houston, Tex.
Houston, East & West Tex. Ry. 3 g. 150 m. 10 lo. 570 c.
Paul Bremond, Pr. & Pur. Agt. ..Houston, Tex.
E. L. Bremond, Gen. Man. ....Houston, Tex.
Ed. Campbell, M. M. ....Houston, Tex.
C. F. Schelewa, M. C. B. ....Houston, Texas.
Houston & Tex. Cen. Ry. 4-8½ g. 750 m. 78 lo. 2,526 c.
Geo. A. Quinlan, Gen. Supt. ......Houston, Tex.
A. H. Swanson, Gen. Tr. Man. ....Houston, Tex.
L. C. Noble, Gen. M. M. ....Houston, Tex.
James McGee, M. C. B. ....Houston, Tex.
So. & Wn. Divs.: M. G. Howe, Supt. Houston, Tex.
No. & Mi. Divs.: G. A. Quinlan, Supt., and
C. H. Burns, Asst. M. M. .....Corsicana, Tex.
No.-Wn. Div.: Donald Allen, Supt. ....Waco, Tex.
Humeston & Shenandoah R. R.
4-8½ g. 113 m. 18 lo. 80 cars.
E. C. Murphy, Gen. Man. ....Clarinda, Ia.
M. B. Snyder, M. M. ....Shenandoah, Ia.
Huntingdon & Br. Top Mt. 4-8½ g. 65 m. 18 lo. 318 c.
Geo. F. Gage, Gen. Man. .....Huntingdon, Pa.
Samuel B. Knight, Pur. Agt. ..Philadelphia, Pa.
William Barkla, M. M. ....Saxton, Pa.

I

Illinois Central R. R. 4-8½ g. 1,928 m. 334 lo. 8,565 c.
E. T. Jeffery, Gen. Supt. ....Chicago, Ill
O. Ott, Pur. Agt. ....Chicago, Ill
Henry Schlacks, Supt. of Mach. ...Chicago, Ill.
W. B. Snow, M. M. Car Works .....Chicago, Ill
(1) Ill. & Ia. Divs.: C. A. Beck, Supt. .....Chicago,
Chic. Div.: T. J. Hudson, Supt. ....Cairo, Ill
Wm. Renshaw, M. M. ....Chicago, Ill.
Mid. Div.: H. L. Frisbie, Supt. ....Pontiac, Ill.
Spring. Div.: W. Wilkinson, Supt. Springfield, Ill.
Wm. Griffin, M. M. ....Clinton, Ill.
No'n Div.: J. C. Jacobs, Supt. ....Amboy, Ill.
J. B. Edams, M. M. ....Amboy, Ill.
Ia. Div.: M. Gilleas, Supt. ....Dubuque, Ia.
Thos. W. Place, M. M. ....Waterloo, Ia.
(2) So. Divs.: C. M. Sheafe, Supt. ...New Orleans, La.
La. Div.: J. M. Turner, Supt. McComb City, Miss.
W. B. McKenna, M. M. ....McComb City, Miss.
Miss. Div.: J. G. Mann, Supt. .....Jackson, Tenn.
J. F. White, M. M. ....Water Valley, Miss.
Illinois Midland Ry. 4-8½ g. 176 m. 12 lo. 611 cars.
D. H. Conklin, Rec. & Gen. Man. .....Decatur, Ill.
O. E. Grady, Train Mast. ....Decatur, Ill.
Frank Young, For. Shops ....Paris, Ill.
Illinois & St. Louis R. R. 4-8½ g. 19 m. 10 lo. 450 c.
C. H. Sharman, Gen. Supt. & P. A. St. Louis, Mo.
D. J. Timlin, M. M. ....Belleville, Ill.
Charles Rothe, M. C. B. ....E. St. Louis, Ill
Indiana, Bloomington & Western Ry.
4-8½ g. 826 m. 108 lo. 4,018 cars.
C. E. Henderson, Gen. Man. Indianapolis, Ind.
I. H. Wilson, Gen. Supt. .....Indianapolis, Ind.
H. C. Norton, Pur. Agt. ......Indianapolis, Ind.
Jos. S. Porter, Div. M. M. ....Sandusky, O.
E. Hiserodt, Gen. M. M. ......Indianapolis, Ind.
M. Fogarty, Div. M. M. ....Urbana, Ill.
W. B. Warren, Div. M. M. ....Indianapolis, Ind.
Indiana, Illinois & Iowa R.R. 4-8½ g. 104 m. 5 lo. 83 c.
F. M. Drake, Pres. ....Kankakee, Ill.
T. P. Shonts, Gen. Supt. ....Kankakee, Ill.
R. C. Ackley, M. M. ....Kankakee, Ill.
Indiana & Illinois Southern Ry. 3 g. 91 m. 3 lo. 69 c.
W. C. Lyon, Gen. Man. & P. Agt. Robinson, Ill.
J. S. Pickering, M. M. & C. B. ..Effingham, Ill.
Indianapolis, Decatur & Springfield Ry.
Geo. Bender, Supt. ....Indianapolis, Ind.
M. M. ....Indianapolis, Ind.
Indianapolis & Evansville Ry. 4-8½ g. 54 m.
D. J. Mackey, Supt. ....Evansville, Ind.
Indianapolis & St. Louis R. R. (See C., C., C. & I.)
Indianapo. & Vincennes R. R. (See Penna. Co.; (8) Div.)
Intercolonial Ry. 4-8½ g. 873 m. 163 lo. 4,589 cars.
David Pottinger, Chief Supt. .....Moncton, N. B.
T. V. Cook, Gen. Storekeeper ...Moncton, N. B.
H. A. Whitney, Mech. Supt. ......Moncton, N. B.
Ewd. D. Shaffer, M. C. B. ....Moncton, N. B.
M. & C. Dist.: J. E. Price, Supt. Campbellton, N. B.
Hal. & St. J. Div.: J. J. Wallace, Supt. .Truro, N. B.
Q. & St. F. Div.: A. R. McDonald, Supt. Riv. du Lp, Q.
International Ry. 4-8½ g. 69 m. 7 lo. 12 cars.
D. E. McFee, Supt. ....Sherbrooke, P. Q.
J. Ruelle, M. M. ....Sherbrooke, P. Q.
W. Charest, M. C. B. ....Sherbrooke, P. Q.
International & Gt. N'n R. R. (See Mo. Pac.; (5) Div.)
Iowa Falls & Sioux City R. R. (See Ill. Cen.)
Iron Mountain & Helena R. R. (See Mo. Pac.; (4) Div.)
Ithaca, Auburn & Western Ry. (See Southern Cen.)

J

Jacksonville So.-E'n R. R. 4-8½ g. 54 m. 5 lo. 69 c.
E. S. Greenleaf, Supt. ....Jacksonville, Ill.
Ira F. Petrie, M. M. ....Jacksonville, Ill.
Jacksonville, St. Augustine & Halifax River Ry.
3 g. 76 m. 3 lo. 27 cars
W. L. Crawford, Gen. Man. ..Jacksonville, Fla.
E. T. Silvius, M. M. ....Jacksonville, Fla.
Jacksonv., Pensacola & Mob. (See Fla. Cent. & W.)
Jacksonville, Tampa & Key West Ry. 5 g. 56 m.
G. W. Bentley, Gen. Man. ....Jacksonville, Fla.
M. R. Moran, Supt. ....Jacksonville, Fla.
F. B. Hurlbut, M. C. B. ....Jacksonville, Fla.
Jamesville & Washington R. R. (See Norfolk So'n.)
Jeffersonv'l, Madison & Indpls. R. R. (See (9) Pa. Co.)
Jersey City & Albany R. R. 4-8½ g. 38 m.
J. W. McCulloh, Manager ....Jersey City, N. J.
Jersey City & Bergen R. R. 4-10 g. 21 m. 2 lo. 13 c.
T. M. Sayre, Supt. ....Jersey City, N. J.
Jersey Shore, Pine Creek & Buff. Ry. (See Phil. & R.)
Junction & Breakwater R.R. (See Del., Md. & Va.

K

Kaaterskill R. R. 3 g. 8 m.
J. H. Jones, *Supt*..........Rondout, N. Y.
Kansas Central R. R. (*See Union Pacific.*
Kansas City, Fort Scott & Gulf R. R.
4-8½ g. 389 m. 75 l. 2,037 c.
Geo. H. Nettleton, *Gen. Man.*.Kansas City, Mo.
L. W. Towne, *Supt*..........Kansas City, Mo.
H. P. Jacques, *Pur. Agt*.....Kansas City, Mo.
J. S. McCrum, *M. M*..........Kansas City, Mo.
A. N. Montier, *M. C. B*......Kansas City, Mo.
Kansas Cy, Lawrence & So. Kan. (*See At.,Top.& S.F.*)
Kansas City, Springfield & Memphis R. R.
4-8½ g. 283 m. 10 lo. 456 cars.
George H. Nettleton, *Pres*....Kansas City, Mo.
L. W. Towne, *Supt*..........Kansas City, Mo.
H. P. Jacques, *Pur. Agt*......Kansas City, Mo.
J. S. McCrum, *M. M*..........Kansas City, Mo.
A. N. Montier, *M. C. B*......Kansas City, Mo.
Kansas City, St. Joseph & Council Bluffs; and St. Jo. & Des Moines R. Rs. 4-8½ & 3 g. 368 m. 41 lo. 1,148 c.
J. F. Barnard, *Gen. Man*.........St. Joseph, Mo.
J. R. Hardy, *Supt*..........St. Joseph, Mo.
D. H. Winton, *Asst. Supt*......St. Joseph, Mo.
A. B. Barnard, *Asst. Supt*....Kansas City, Mo
Wm. Irving, *Pur. Agt*..........Chicago, Ill.
F. A. Chase, *M. M*..........St. Joseph, Mo
Thos. Aylesbury, *For. Car. Dep.*St. Joseph, Mo
Kansas City & Southern Ry. 4-8½ g. In progress.
Wm. Bailey, *Pres*..........Kansas City, Mo.
Kansas Coal Belt R. R. 4-8½ g. In progress.
C. H. Malin, *Gen. Man*..........Girard, Kan.
F. A. Hill, *Supt*..........Girard, Kan.
Kansas & Gulf Short Line R. R. 33 m. 2 lo. 32 cars.
Gen. Man..........Tyler, Tex.
V. K. Stevenson, *Pur. Agt*.....New York, N. Y.
Kent Northern Ry. 4-8½ g. 27 m. 2 lo. 16 cars.
J. C. Brown, *Gen. Man*......Richibucto, N. B.
Kentucky Central R. R. 4-9 g. 255 m. 28 lo. 640 cars.
H. E. Huntington, *Supt*..........Covington, Ky.
W. T. Smith, *M. of Mach*..........Covington, Ky.
Kentucky & South Atlantic Ry. 3 g. 23 m. 3 lo. 52 c.
Geo. B. Harper, *Supt. & P.A.*.Mt. Sterling, Ky
Geo. W. Lewis, *M. M*..........Mt. Sterling, Ky.
Keokuk & Des Moines R. R. (*See Chi., R. I. & Pac.*)
Kingston & Pembroke Ry. 4-8½ g. 104 m. 9 lo. 214 c.
B. W. Folger, *Supt*..........Kingston, Ont.
J. H. Taylor, *Pur. Agt*..........Kingston, Ont.
J. H. Taylor, *M. M*..........Kingston, Ont.
Knox & Lincoln R. R. 4-8½ g. 49 m. 6 lo. 119 cars.
C. A. Coombs, *Supt*..........Bath, Me.
Wm. A. Field, *M. M*..........Bath, Me.
C. L. Turner, *M. C. B*..........Bath, Me.
Knoxville & Augusta R. R. 5 g. 16 m. 2 lo. 34 cars.
R. N. Hood, *Gen. Man. & P. Agt.*Knoxville, Tenn
J. M. Hood, *Supt*..........Knoxville, Tenn.

L

Lackawanna & Pittsburgh R. R. 3 g. 97 m.
Geo. W. Chapman, *Rec*..........Angelica, N. Y.
Lake Champlain & Moriah R.R. 4-8½ g. 8 m. 8 lo. 222c
E. B. Hedding, *Supt*..........Port Henry, N. Y.
Lake Erie & Western Ry. 4-8½ g. 388 m. 53 lo. 1,701 c.
J. H. Cheney, *Gen. Man*.....Bloomington, Ill.
D. S. Hill, *Gen. Supt*..........Bloomington, Ill.
T. H. Perry, *Pur. Agt*..........Bloomington, Ill.
H. L. Cooper, *Supt. of Equipment*....Lima, O.
Lake George & Muskegon River R. R.
4-8½ g. 20 m. 4 lo. 79 cars.
W. S. Gerrish, *Gen. Man*... Muskegon, Mich.
Lake Shore & Michigan So'n Ry.
4-8½ g. 1,340 m. 547 lo. 17,115 cars.
John Newell, *Pres*..........Cleveland, O.
P. P. Wright, *Gen. Supt*..........Cleveland, O.
L. G. Higgins, *Pur. Agt*..........Cleveland, O.
G. W. Stevens, *Supt. M. P*..........Cleveland, O.
John Kirby, *Gen. M. C. B*..........Cleveland, O.
East'n Div.: C. B. Couch, *Supt*.....Cleveland, O.
J. S. Graham, *M. M*..........Buffalo, N. Y.
A. C. Robson, *M. C. B*..........Buffalo, N. Y.
L. O. Gassett, *M. M*..........Cleveland, O.
J. Withycombe, *M. C. B*..........Cleveland, O.
Frank. Div.: G. H. McIntire, *Supt.* Youngstown, O.
Toledo Div.: Thos. Flesher, Jr., *Supt.* Cleveland, O.
J. M. Sanborn, *M. M*..........Norwalk, O.
W. O. Smith, *M. C. B*..........Norwalk, O.
Mich. Divs.: J. E. Curtis; *Supt*..........Toledo, O.
Det. Brs.: T. J. Charlesworth, *Supt.* Detroit, Mich.
Lansing, Ypsilanti & Ft. Wayne Branches.
W. H. Caniff, *Supt*..........Hillsdale, Mich.
Western Div.: A. G. Amsden, *Supt*...Chicago, Ill.
W. L. Gilmore, *M. M*..........Elkhart, Ind.
Frank O. Bray, *M. C. B*..........Adrian, Mich.
Gr. Rap. Br.: M. E. Wattles, *Supt.* Kalamazoo, Mich
Lake Tahoe R. R. 3 g. 10 m. 3 lo. 49 cars.
D. L. Bliss, *Gen. Man*..........Carson, Nev.
John T. Rogers, *Gen. Supt*..........Carson, Nev
Tho. Morris, *M. M*..........Carson, Nev.
Leavenworth, Topeka & So. W'n Ry. (*See A.T.&S.F.*)
Lebanon Springs R. R. 4-8½ g. 58 m. 5 lo. 44 c.
W. C. Alstyne, *Gen. Man*..........Albany, N. Y.
W. H. Hawkins, *Pur. Agt*..........Albany, N. Y.
Geo. Tefft, *M. M*..........Chatham, N. Y.
Lehigh Valley R. R. 4-8½ g. 495 m. 392 lo. 36,908 c.
H. S. Goodwin, *Gen. Supt*..........Bethlehem, Pa.
W. C. Alderson, *Pur. Agt*.....Philadelphia, Pa.
John I. Kinsey, *M. M*..........So. Easton, Pa.
John S. Lentz, *M. C. B*..........Packerton, Pa.
N.J. Div.: Jas. Donnelly, *Supt.* Perth Amboy, N. J.
Coal Rds.: J. I. Blakeslee, *Supt.* Mauch Chunk, Pa.
D. Clark, *M. M*..........Hazleton, Pa.
John Campbell, *M. M*..........Delano, Pa.
B. M. Div.: A. G. Brodhead, *S.*.Mauch Chunk, Pa.
P. Hofecker, *M. M*..........Weatherly, Pa.
Wy. Div.: A. Mitchell, *S. & M. M.* Wilkesbarre, Pa.
Pa. & N. Y.: and Geneva, Ithaca & Sayre R. Rs.
Wm. Stevenson, *Gen. Supt*..........Sayre, Pa.
J. N. Weaver, *M. M*..........Sayre, Pa.
Jno. S. Lentz, *M. C. B*..........Packerton, Pa.
Lehigh & Hudson River Ry. 4-8½ g. 63 m. 8 lo. 350 c.
Grinnell Burt, *Gen. Man*..........Warwick, N. Y.
N. L. Furman, *Supt*..........Warwick, N. Y.
John Sayre, *Pur. Agt*..........Warwick, N. Y.
S. Mills, *M. M*..........Warwick, N. Y.
Lehigh & Lackawanna and Lehigh & Susquehanna R. Rs. (*See Phil. & Read.; N. J. Cen. Div.*)
Levis & Kennebec R. R. (*See Quebec Cen.*)
Litchfield, Carrollton & Western R. R. 4-8½ g. 22 m.
H. S. Carroll, *Prest. & G. Man.*.Carrollton, Ill.
Ligonier Valley R. R. 4-9 g. 11 m. 2 lo. 22 cars.
Thos. A. Mellon, *Gen. Manager*..Pittsburgh, Pa.
Geo. Senft, *Supt. & P. Agt*..........Latrobe, Pa.
Little Miami R. R. (*See Penna. Co.'s Rds.; (8) Div.*)
Little Rock, Miss. River & Texas Ry.
4-8½ g. 170 m. 12 lo. 299 cars.
H. Wood, *Gen. Man*..........Little Rock, Ark.
F. A. Lister, *Gen. Supt*..........Little Rock, Ark.
F. Hufsmith, *M. M. & C. B.*..........Argenta, Ark.
Little Rock & Fort Smith. 4-8½ g. 170 m. 13 lo. 360 c
Hy. Wood, *Gen. Man*..........Little Rock, Ark
F. A. Lister, *Supt*..........Little Rock, Ark.
F. Hufsmith, *M. M. & M. C. B.*....Argenta, Ark
Little Saw Mill Run R. R. 3 & 4-8½ g. 8 m. 4 lo. 327 c.
T. Hartley, *Gen. Man*..........Banksville, Pa.
Long Island R. R. 4-8½ g. 352 m. 92 lo. 953 cars.
I. D. Barton, *Gen. Supt.* Long Island City, N. Y.
Benj. Norton, *Pur. Agt.* Long Island City, N. Y.
C. A. Thompson, *M. M.* Long Island City, N. Y.
Longview & Sabine Valley R. R. (*See Gal. Sab. & St. L.*)
Louisiana W'n R. R. (*See Cen. Pac.; G., H. & S. A. Div.*)
Louisville, Cin. & Lexington R. R. (*See Louis. & N.*)
Louis., Evans. & St. L. Ry. 4-8½ g. 254 m. 24 lo. 1,032 c.
Geo. F. Evans, *Rec*..........Louisville, Ky.
R. S. Minor, *Gen. Supt*..........Louisville, Ky.
F. P. Boatman, *M. M*..........Evansville, Ind.
Louisville, New Albany & Chicago Ry.
4-8½ g. 479 miles 60 lo. 3,700 cars.
John B. Carson, *Gen. Man*..........Chicago, Ill
W. R. Woodard, *Gen. Supt*..........Chicago, Ill.
H. O. Nourse, *Pur. Agt*..........Chicago, Ill.
Josiah Bettis, *M. M*..........New Albany, Ind.
Chas. Coller, *M. C. B*..........New Albany, Ind.
C. C. F. Bent, *Supt. Trans*..........Lafayette, Ind.
Louisville, New Orleans & Tex. Ry. 455 m. In progress.
Jas. M. Edwards, *Gen. Man*..........Memphis, Tenn.
M. Burke, *Gen. Supt*..........Memphis, Tenn.
John Bradley, *Asst. Supt*.....New Orleans, La.
A. M. Cooke, *Pur. Agt*..........Memphis, Tenn.

E. D. Anderson, *M. M*..........Vicksburg, Miss.
J. J. Casey, *M. C. B*..........Vicksburg, Miss.
Louisville & Nashville R. R.
5 g. 2,186 m. 380 lo. 12,197 cars.
Reuben Wells, *Gen. Man*..........Louisville, Ky.
J. T. Harahan, *Asst. Gen. M.*...Louisville, Ky.
Geo. F. Evans, *Supt*..........Louisville, Ky.
P. P. Huston, *Pur. Agt*..........Louisville, Ky.
Harvey Middleton, *Supt. Mach.*.Louisville, Ky.
Louisv., Cin. & Lex. Divs.:
J. G. Metcalf, *Supt. Trans*.....Louisville, Ky.
P. Leeds, *M. M*..........Louisville, Ky.
J. W. Luttrell, *M. M*..........Louisville, Ky.
J. G. Clifford, *M. M.* (2d & C. Div.). Bowling Grn. Ky.
Henderson Div.: J. Geddes, *Supt.* Henderson, Ky.
W. P. Pike, *M. M*..........Nashville, Tenn.
Nash. & D. Div.: J. Geddes, *Supt.* Nashville, Tenn.
Elkton & Guthrie:
J. Geddes, *Supt*..........Nashville, Tenn.
S.&N.A.Div.: Levi Hedge, *Supt.* Birmingham, Ala.
C. W. White, *M. M*..........Birmingham, Ala.
Mob. & M.; N. Div. Pens. & Sel.; Sl. & Mont. R. Rs.:
B. C. Epperson, *Supt*..........Montgomery, Ala.
J. N. Hall, *M. M.* (Mont. Shops). Montgomery, Ala.
N. O. Div.: O. M. Dunn, *Supt*...New Orleans, La.
Wm. Adair, *M. M*..........Mobile, Ala.
Memp. Div.: W. Colcamp, *Supt.* Memphis, Tenn.
J. V. Slusser, *M. M*..........Memphis, Tenn.
St. L. Div.: C. O. Parker, *Supt.* Montgomery, Ala.
Thos. Walsh, *M. M*..........Mt. Vernon, Ill.
Pensacola and So. Div. Pens. & Selma and P. & A. Rds.:
E. O. Saltmarsh, *Supt*..........Pensacola, Fla.
W. D. Robb, *M. M*..........Pensacola, Fla.
Louisville & Wadley R. R. 5 g. 10 m. 1 lo. 5 c.
J. H. Wilkins, *Supt. & Pur. Agt.* Louisville, Ga.

M

Macon & Brunswick R. R.
(*See E. Tenn., Vir. & Ga.; At. & Ga. Divs.*)
Maine Central R. R. 4-8½ g. 525 m. 82 lo. 2,168 c.
Payson Tucker, *Gen. Man*..........Portland, Me.
Amos Pillsbury, *M. M*..........Waterville, Me.
C. H. Kenison, *M. C. B*..........Augusta, Me.
Eastern Maine. 3 g. 19 m. 2 lo. 40 c.
L. L. Lincoln, *Supt*..........Portland, Me.
Manchester & Keene R. R. 4-8½ g. 30 m. (*See Concord.*)
Manchester & Lawrence R. R. (*See Concord.*)
Manchester & North Weare R. R. (*See Concord.*)
Manhattan Ry. 4-8½ g. 32 m. 228 lo. 652 pass. c.
Frank K. Hain, *Gen. Man*.....New York, N. Y.
W. T. Goundie, *Supt. Trans.*.New York, N. Y.
T. W. Peeples, *M. M*..........New York, N. Y.
H. A. Webster, *M. C. B*..........New York, N. Y.
Manitoba Southwestern Colonization Ry.
4-8½ g. 52 m. 3 lo. 125 cars.
J. M. Eagan, *V. Pres*..........Winnipeg, Man.
W. T. Reed, *M. M*..........Winnipeg, Man.
Marietta & Cincinnati R. R. (*See Cin. Wash. & Balt.*)
Marietta & North Georgia R. R. 3 g. 70 m. 4 lo. 45 c.
J. B. Glover, *Gen. Man*..........Marietta, Ga.
W. R. Power, *Pur. Agt*..........Marietta, Ga.
C. Chester, *M. M*..........Marietta, Ga.
Marquette, Houghton & Ontonagon R. R.
4-8½ g. 100 m. 42 lo. 2,530 cars.
John Hornby, *Gen. Man*..........Marquette, Mich
W. A. Thompson, *Ass't Supt.* Marquette, Mich.
M. B. McGee, *Pur. Agt*..........Marquette, Mich.
W. A. Mahan, *M. M*..........Marquette, Mich.
H. D. Lyons, *M. C. B.*..........Marquette, Mich.
Maryland Central R. R. 3 g. 27 m. 4 lo. 56 cars.
S. G. Boyd, *Supt*..........Baltimore, Md.
Marquette & Western. 4-8½ g. 25 m. 10 l. 500 c.
D. McCool, *Gen. Supt*..........Marquette, Mich.
W. J. Tench, *Pur. Agt*..........Marquette, Mich.
J. B. Wilson, *Mech. Supt*..........Marquette, Mich.
Massachusetts Central R. R. 4-8½ g. 48 m. 5 l. 81 c.
E. G. Allen, *Supt. & Pur. Agt*....Boston, Mass.
E. A. Walker, *M. M*..........So. Sudbury, Mass.
Memphis & Charleston R. R. (*See E. Tenn. Va. & Ga.*
Memphis & Lit. Rock R. R. 5 g. 135 m. 14 lo. 299 c.
R. Fink, *G. Man. & P. A*......Little Rock, Ark.
H. G. Fleming, *Supt*..........Memphis, Tenn.
Thos. Rennell, *M. M*..........Argenta, Ark.
T. Rennell, *M. C. B*..........Argenta, Ark
Mexican Ry. 4-8½ g. 293 m. 42 lo. 616 cars.
E. W. Jackson, *Gen. Man*.....Mexico, Mex.
Mexican Central Ry. 4-8½ g. 1,224 m. 94 lo. 2,609 c.
Theo. Nickerson, *Pur. Agt*......Boston, Mass.
E. W. Jackson, *Gen. Man*...El Paso del Norte.
D. MacKenzie, *Gen. Supt*......City of Mexico.
F.W. Johnstone, *Supt. M.P.&M.* City of Mexico.
J. H. O'Brien, *M. M*..........City of Mexico.
G. T. Jarvis, *Div. Supt*..........City of Mexico.
A. Smith, *Div. Supt*..........Silao, Mex.
I. A. Eacutt, *Div. Supt*..........Jimulco, Mex.
R. E. Comfort, *Div. Supt.*.Paso del Norte, Mex.
R. S. Simpson, *M. M*..........City of Mexico.
A. Hendee, *M. M*..........Calera, Mex.
C. F. Stewart, *M. M*..........Silao, Mex.
W. L. Wallace, *M. M*..........Jimulco, Mex.
J. G. McCuen, *M. M*..........Chihuahua, Mex.
Tampico Div: E. A. Whorf, *Supt.* Tampico, Mex.
San Blas Div.: C. E. Payne, *Supt.*.San Blas, Mex.
Mexican National Ry. 3 g. 766 m. 50 lo. 1,283 c.
Northern General Division:
D. C. Dodge, *V. P. & Gen. Man*...Laredo, Tex
C. A. Merriam, *Gen. Supt*......Laredo, Tex.
F. W. Baldwin, *Asst. Gen. Supt.*.Laredo, Tex.
John Grace, *M. M*..........Laredo, Tex.
T. Milan, *M. M*..........Corpus Christi, Tex.
Metamoras, Div.:
W. W. Mayberry, *Asst. Supt.*.Brownsville, Tex.
Galveston Div.:
T. E. Quinn, *Asst. Supt*..........Galveston, Tex.
Southern General Division:
W. E. Lewis, *Supt*..........Mexico, Mex.
R. C. Peebles, *Asst. Supt*..........Mexico, Mex.
J. M. Winslow, *M. M*..........Mexico, Mex.
Zacatecas Div.:
C. Langrand, *Manager*..........Zacatecas, Mex.
Michigan Cen. R. R. 4-8½ g. 1,485 m. 357 lo. 11,284 c.
H. B. Ledyard, *Pres. & Gen. Man.* Detroit, Mich.
E. C. Brown, *Gen. Supt*..........Detroit, Mich.
Robert Miller, *Asst. Gen. Supt*...Detroit, Mich.
Allan Bourn, *Pur. Agt*..........Detroit, Mich.
C. E. Smart, *Gen. M. M*..........Jackson, Mich.
(1) Lines West of Detroit River:
E. C. Brown, *Gen. Supt*..........Detroit, Mich.
East. Div.: D. S. Sutherland, *Supt.* Detroit, Mich.
Bay City, Saginaw & Mackinaw Divisions.:
W. A. Vaughan, *Supt*..........Bay City, Mich.
C. E. Smart, *M. M*..........Bay City, Mich.
Main Line: Gr. Rap.; So. Bend; and So. Hav. Divs.:
C. B. Bush, *Supt*..........Jackson, Mich.
W'n Divs.: R. H. L'Hommedieu, *Supt.* Chicago, Ill.
(2) Lines East of Detroit River:
J. B. Morford, *Supt*..........St. Thomas, Ont.
A. F. Bull, *M. M*..........St. Thomas, Ont.
Rob't Potts, *M. C. B*..........St. Thomas, Ont.
Michigan & Ohio.
L. A. Latcha, *Gen. Man*..........Toledo, O.
W. L. Webb, *Pur. Agt*..........Toledo, O.
D. J. Durrell, *M. M*..........Marshall, Mich.
Middleburg & Schoharie; and Schoharie Valley R. Rs. 4-8½ g. 11 m. 2 lo. 6 cars.
P. S. Danforth, *Gen. Supt*...Middleburg, N. Y.
Midland of Canada. (*See Grand Trunk.*)
Midland No. Carolina Ry. 5 g. 95 m. 9 lo. 82 cars.
Atlantic & North Carolina Ry. 22 m.
John D. Whitford, *Gen. Man*..Newbern, N. C.
J. A. Bryan, *Supt*..........Newbern, N. C.
D. J. Sprague, *Pur. Agt*..........New York, N. Y.
B. Manly, *Supt. of Mach*..........Newbern, N. C.
Milford & Woonsocket.
W. W. Jencks, *Supt*..........Milford, Mass.
Milton & Sutherlin. (*Oper. by Rich. & Danville.*)
Milwaukee, Lake Shore & Western Ry.
4-8½ g. 370 m. 45 lo. 1,536 cars.
H. G. H. Reed, *Gen. Supt*.....Milwaukee, Wis.
J. Donahue, *Supt*..........Milwaukee, Wis.
John Hickey, *M. M*..........Ledyard, Wis.
Milwaukee & Northern and Wisconsin & Michigan R. Rds. 4-8½ g. 228 m. 24 l. 703 cars.
C. F. Dutton, *Gen. Supt*..........Milwaukee, Wis.
N. S. Kimball, *M. M*..........Ft. Howard, Wis.
Mineral Range R. R. 3 g. 13 m. 4 lo. 43 cars.
Chas. E. Holland, *Pr. & Supt*...Hancock, Mich.

W. H. Carr, *Pur. Agt*..........Hancock, Mich.
T. J. Shellhorn, *M. M. & C. B.*.Hancock, Mich.
Minneapolis, Lyndale & Minnetonka Ry.
3 g. 25 miles 4 motors 1 lo. 35 cars.
William McCrory, *Man*.....Minneapolis, Minn.
T. W. Heintzelman, *M. M.*.Minneapolis, Minn.
Minneapolis, S. Ste. Marie & Atlantic Ry.
4-8½ g. 45 m.
W. W. Rich, *Supt*..........Minneapolis, Minn.
Minneapolis & St. Louis Ry.
4-8½ g. 560 m. 72 lo. 2,060 c.
W. H. Truesdale, *V. Pres.*.Minneapolis, Minn.
T. E. Clarke, *Gen. Supt*....Minneapolis, Minn.
W. B. Palmer, *Pur. Agent.* Minneapolis, Minn.
G. F. Wilson, *M.M.&M.C.B.* Minneapolis, Minn.
Missisquoi R. R. 4-8 g. 28 m.
W. C. Smith, *Man*..........St. Albans, Vt.
Mississippi, Terre aux Bœufs & Lake R. R.
29 miles.
M. R. Spelman, *Supt*.......New Orleans, La.
Mississippi & Tenn. R. R. 4-8½ g. 101 m. 12 lo. 194 c.
Jas. M. Edwards, *Gen. Man*....Memphis, Tenn.
J. C. Ramsey, *M. M*..........Memphis, Tenn.
S. J. Bolton, *M. C. B*..........Memphis, Tenn.
Missouri, Iowa & Nebraska R. R. 4-8½ g. 143 m.
H. T. Clark, *Supt*..........Alexandria, Mo.
Missouri, Kansas & Texas Ry. (*See Mo. Pac.; (2) Div.*)
Missouri Pacific Ry. (Leased and operated lines.)
4-8½ g. 6,029 m. 697 lo. 19,748 cars.
H. M. Hoxie, *3d V. Pres*..........St. Louis, Mo
R. B. Lyle, *Pur. Agt*..........St. Louis, Mo.
(1), (2) and (3) Divs.:
John Hodge, *Supt. Car Dep*.......St. Louis, Mo.
Frank Howard, *Asst. Supt. C.D.*.Marshall, Tex.
(4), (5) and (6) Divs.:
O. A. Haynes, *Insp. L. C. & M.*..St. Louis, Mo.
(1) Missouri Pacific Ry. 1,028 m. 155 lo. 4,218 cars.
E. K. Sibley, *Supt*..........Sedalia, Mo.
T. W. Newell, *M. M*..........Sedalia, Mo.
E. Taylor, *Asst. M. M*..........Sedalia, Mo.
W'n Div.: M. C. Straight, *Supt*..........Sedalia, Mo.
L. Bartlett, *M. M*..........St. Louis, Mo.
(2) Mo., Kan. & Tex. Ry. 1,308 m. 140 lo. 4,248 cars.
Jos. Herrin, *Supt*..........Sedalia, Mo.
J. J. Frey, *Div. Supt*..........Sedalia, Mo.
T. G. Golden, *Div. Supt*..........Parsons, Kan.
S. Irvin, *Asst. Supt. Car Dep*......Sedalia, Mo.
E. K. Sibley, *Supt*..........Parsons, Kan.
W. E. Phillips, *M. M*..........Parsons, Kan.
(3) Central Branch Un. Pac. R. R. 388 m. 30 lo. 509 c.
W. W. Fagan, *Supt*..........Atchison, Kan.
H. V. Faries, *M. M*..........Atchison, Kan.
J. W. Blackburn, *A. Supt. Car D.*.Atchison, Kan.
(4) St. L., I. Mt. & So'n Ry. 905 m. 138 lo. 4,928 c.
Wm. Kerrigan, *Supt*..........St. Louis, Mo.
St. Louis Div.: W. H. Harris, *M. M.*.De Soto, Mo.
Ark. Div.: *Supt*......Little Rock, Ark
R. M. Richardson, *M. M*......Little Rock, Ark.
(5) Int. & G. No.: *Supt.*.Palestine, Tex.
M. M..........Palestine, Tex.
(6) Tex. & Pac: Warder Cumming, *Supt.* Marshall, Tex.
E. N. O. & Tr. Cont. Divs.:
Geo. Dimick, *Supt*..........Marshall, Tex.
E. R. Smith, *M. M. & M. C. B.*.N. Orleans, La.
Rio Grande Div.:
L. L. Keller, *Supt*..........Big Springs, Tex.
Mobile & Ala. Grand Trunk R. R. 5 g. 59 m. 2 lo. 23 c.
Wm. H. Pratt, *Trustee*..........Mobile, Ala.
Mobile & Girard R. R. 5 g. 84 m. 7 lo. 112 cars
W. L. Clark, *Gen. Supt*..........Columbus, Ga.
J. C. Albrecht, *M. M*..........Columbus, Ga.
A. J. Nix, *M. C. B*..........Columbus, Ga.
Mobile & Montgomery Ry. (*See Louis. & Nash.*)
Mobile & Northwestern R. R. 3 g. 31 m. 2 lo. 16 c.
Thomas T. A. Lyon, *Pres*..........Glendale, Miss.
Mobile & Ohio R. R. 5 g. 528 m. 75 lo. 1,353 cars.
T. M. R. Talcott, *V.-Pr. & Gen. Man.* Mobile, Ala.
J. G. Motley, *Gen. Supt*..........Mobile, Ala.
F. Jordan, *Pur. Agt*..........Mobile, Ala.
M. T. Carson, *Gen. M. M*..........Whistler, Ala.
J. T. Booth, *M. C. B*..........Whistler, Ala.
So'n Div.: ....Mobile, Ala.
L. J. Morris, *M. M*..........Macon, Miss.
No'n Div.: E. S. Hosford, *Supt*..Jackson, Tenn.
H. C. Goode, *M. M*..........Jackson, Tenn.
Mobile & Spring Hill R. R. 5-2 g. 8 m. 1 lo. 16 cars.
F. Ingate, *Manager*..........Mobile, Ala.
Moline & Southeastern R. R. 3-6 g. 8 m. 2 lo. 26 c.
R. Battersly, *Gen. Man*..........Coal Valley, Ill.
Mont Alto R. R. 4-9 g. 21 m. 2 lo. 8 cars.
G. B. Wiestling, *Supt. & P. A*....Mont Alto, Pa.
Montgomery & Eufaula Ry. (*See Cen. of Ga.*)
Montgomery Southern Ry. 3 g. 20 m. 1 lo. 15 cars.
S. D. Hubbard, Jr., *Gen. Man.* Montgomery, Ala.
Montour R. R. 4-8½ g. 12 m. 2 lo. 130 cars.
C. R. Brown, *Supt. & Pur. Agt*...Imperial, Pa.
Henry Newman, *M. C. B*..........Imperial, Pa.
Montpelier & Wells Riv. R. R. 4-8½ g. 38 m. 3 lo. 86c.
W. A. Stowell, *Supt*..........Montpelier, Vt.
Montreal Portland & Boston Ry. (*See Passumpsic.*)
Montreal & Sorel Ry. 4-8½ g. 47 m. 3 lo. 35 c.
C.N. Armstrong, *G. M. & Pur. Agt.* Sorel, P. Q.
J. F. Armstrong, *Gen. Supt*..........Sorel, P. Q.
G. W. Pangborn, *M. M*..........Sorel, P. Q.
Montrose Ry. 3 g. 28 m. 3 lo. 24 cars.
T. G. Walter, *Gen. Supt*..........Tunkhannock, Pa.
Morgan's Louis. & Tex. R. R. 4-8½ g. 260 m. 46 l. 1,339 c.
J. Kruttschnitt, *Supt*..........New Orleans, La.
C. Trumpy, *Pur. Agt*..........New Orleans, La.
J. D. Connell, *M. M*..........Algiers, La.
Jno. Hildebrand, *M. C. B*..........Algiers, La.
Mount Washington R. R. 5-3 g. 3 m. 6 lo. 6 cars.
Walter Aiken, *Gen. Man*..........Franklin, N. H.

N

Nantasket Beach R. R. 4-8½ g. 6 m. 5 lo. 25 c.
George L. Keyes, *Gen. Supt*......Boston, Mass.
Naugatuck R. R. 4-8½ g. 62 m. 17 lo. 547 cars.
Geo. W. Beach, *Supt*..........Waterbury, Conn.
H. A. Bishop, *Pur. Agt*..........Bridgeport, Conn.
H'y D. Beach, *Supt. R. S*....Bridgeport, Conn.
Napanee, Tamworth & Quebec Ry. In progress.
Ed. W. Rathbun, *Gen. Man*....Deseronto, Ont.
R. C. Carter, *Asst. Gen. Man*..Deseronto, Ont.
Narragansett Pier R. R. 4-8½ g. 8 m. 2 lo. 11 c.
G. T. Lanphear, *Supt. & Pur. Agt.* Peacedale, R. I.
Nashua & Rochester R. R. (*See Wor. & Nash.*)
Nashville, Chattanooga & St. Louis Ry.
5 g. 539 miles 87 lo. 1,979 cars.
J. W. Thomas, *G. Man. & P. Agt.* Nashville, Tenn.
M. J. C. Wrenne, *Supt*..........Nashville, Tenn.
James Cullen, *M. M. & C. B.*...Nashville, Tenn.
Nashville & Florence R. R. 5 g. 51 m.
J. Geddes, *Supt*..........Columbia, Tenn.
Natchez, Jackson & Col. R. R. 3-6 g. 100 m. 7 lo. 92 c.
E. D. Frost, *Gen. Supt*..........Natchez, Miss.
Nebraska, Topeka, Iola & Memphis R. R. 4-8½ g. 16 m.
H. M. Clarke, *Gen. Man*..........Girard, Kan.
C. H. Malin, *Gen. Supt*..........Girard, Kan.
New Brunswick Ry. 4-8½ g. 447 m. 40 lo. 935 cars.
F. W. Cram, *G. M. & Pur. Agt*..St John, N. B.
Geo. A. Haggerty, *M. M*..........McAdam, N. B.
Jas. Jackson, *Asst. M. M*..........McAdam, N. B.
New Brunswick & Can. Ry. (*See New Brun.*)
Newburg, Dutchess & Conn. R. R. 4-8½ g. 58 m.
C. L. Kimball, *Supt. & P. Agt.* Matteawan, N. Y.
New Castle R. R. 3-6 g. 5 m. 2 lo. 76 cars.
Geo. Pearson, *Gen. Man*..........New Castle, Pa.
New Castle & Beaver Valley R. R. (*See Penna. Co.*)
New Haven & Derby R. R. 4-8½ g. 13 m. 4 lo. 70 c.
E. S. Quintard, *Supt*..........New Haven, Conn.
J. M. Whitlock, *M. M. & C. B.* New Haven, Conn.
New Haven & No'mpton. 4-8½ g. 170 m. 28 lo. 579 c
S. B. Opdyke, Jr., *Supt*..........New Haven, Ct.
R. G. Curtis, *Pur. Agt*..........New Haven, Ct.
Henry Fox, *M. M*..........New Haven, Ct.
John Sweeny, *For Car. Shps*...New Haven, Ct.
New Jersey & New York Ry. 4-8½ g. 37 m. 6 lo. 40 c.
J. D. Hasbrouck, *Gen. Man*..Jersey City, N. J.
J. S. Drake, *Supt. & M. M*..........Hillsdale, N. J.
L. B. Van Wagonen, *M. C. B*.....Hillsdale, N. J.
N. J. Southern Ry. (*See Phil. & Read.; N. J. So. Div.*)
New London Northern R. R. (*See Central Ver.*)
New Orleans, B. Rouge, Vicks. & Memphis.
Jas. M. Edwards, *Gen. Man*..New Orleans, La.
John Bradley, *Supt*..........New Orleans, La.

New Orleans Pacific Ry. (*See Mo. Pac.; (6) Div.*)
New Orleans & Carrollton R. R.
4-8½ g. 15 m. 12 lo. 79 cars.
C. V. Halle, *Supt*..........New Orleans, La.
John Dahmer, *M. M*..........New Orleans, La.
Jas. Thorn, *M. C. B*..........New Orleans, La.
New Orleans & Mobile R. R. (*See Louis. & Nash.*)
N.O.& Northeastern R. R. (*See Cin., N. O.& Tex. Pac.*)
New Orleans & Selma R. R. 5 g. 21 m. 1 lo. 8 cars.
L. B. Schofield, *Supt*..........Selma, Ala.
Newport & Wickford R. R. 4-8½ g. 22 m.
Theo. Warren, *Supt*..........Newport, R. I.
Nevada Central R. R.:
C. W. Hinchcliffe, *Rec. & Supt*...Austin, Nev.
Louis Parisoe, *M. M*.....Battle Mountain, Nev.
J. B. Gilchrist, *Pur. Agt*..........Austin, Nev.
Nevada County N. G. R. R. 3 g. 23 m. 3 lo. 46 cars.
John F. Kidder, *Supt*..........Grass Valley, Cal.
Jas. McCormick, *M. M. & C. B.* Grass Valley, Cal.
Nevada & Oregon R. R. 3 g. 30 m. 25 cars.
D. W. Balch, *Supt*..........Reno, Nev.
N. Y. Central & Hudson River R. R.
4-8½ g. 983 m. 676 lo. 25,161 cars.
J. M. Toucey, *Gen. Supt*......New York, N. Y.
Chas. Reed, *Pur. Agt*..........New York, N. Y.
Wm. Buchanan, *Supt. M. P. and R. Stock*, New York, N. Y.
N. Y. & Har. Div.: C. M. Bissell, *Supt.* do.
P. McQ. Gibson, *M. M*..........New York, N. Y.
Hud. Riv. Div.: C. M. Bissell, *Supt.* N. York, N. Y.
W. H. Wolfrath, *M. C. B*....New York, N. Y.
E'n Div.: Zenas C. Priest, *Supt.* Ltle Falls, N. Y.
John Ortton, *M. M*..........West Albany, N. Y.
L. Packard, *M. C. B*......West Albany, N. Y.
W'n Div.: Geo. H. Burrows, *Supt*...Buffalo, N. Y.
S. L. White, *M. M*..........Syracuse, N. Y.
Amos Gould, *M. M*..........E. Buffalo, N. Y.
E. Chamberlain, *M. C. B*...E. Buffalo, N. Y.
Peter Smith, *M. C. B*.....E. Rochester, N. Y.
Ed. Donaby, *M. C. B*....Niagara Falls, N. Y.
N. Y. Chic. & St. L. Ry. 4-8½ g. 524 m. 108 lo. 7,245 c
Lewis Williams, *Gen. Man*..........Cleveland, O
M. M. Rogers, *Pur. Agt*..........Cleveland, O.
Jno. Mackenzie, *Supt. M. P*......Cleveland, O
Eas'tn Div.: G. H. Kimball, *Supt*..Cleveland, O
E. A. Miller, *M. M*..........Conneaut, O
West'n Div.: C. D. Gorham, *Supt*...Chicago, Ill.
W. H. Lewis, *M. M*..........Englewood, Ill.
New York City & Northern. 4-8½ g. 58 m. 17 lo. 368 c
Frank S. Gannon, *Gen. Supt.* High Bridge, N. Y.
Thos. Millen, *M. M*..........High Bridge, N. Y.
New York, Lackawanna & W'n Ry. (*See Del. L.& W.*)
New York, Lake Erie & Western R. R.
S. M. Felton, Jr., *V. Pr*..........New York, N. Y.
(1) N.Y., L.E.&W. Div.: 4-8½ g. 1,073m. 576lo. 30,553c.
B. Thomas, *Gen. Supt*..........Jersey City, N. J.
W. G. Tuller, *Pur. Agt*..........New York, N. Y.
F. M. Wilder, *Supt. M. P. & M*...Susqueh'a, Pa.
E'n Div.: E. O. Hill, *Supt*......Jersey City, N. J.
J. H. Vreeland, *M. M*..........Jersey City, N. J.
J. N. Mileham, *M. C. B*.....Jersey City, N. J.
Del. Div.: E. Van Etten, *Supt.*.Fort Jervis, N. Y.
J. Van Vechten, *M. M. & C. B.* Pt. Jervis, N. Y.
Susq. Div.: R. B. Cable, *Ast. Supt.*.Elmira, N. Y.
V. Blackburn, *M. M*..........Susquehanna, Pa
D. B. Goodell, *M. C. B*..........Elmira, N. Y
Buf. & R. Divs.: W. J. Murphy, *Supt.*; and
Wm. Litz, *M. M*..........Buffalo, N. Y.
M. Wilder, *M. C. B*..........Buffalo, N. Y.
B. & S.-W. Div.: C. A. Brunn, *Supt.* do.
W'n Div.: W. B. Coffin, *Supt.*.Hornellsville, N. Y.
J. Hawthorne, *M. M*......Hornellsville, N. Y.
N. Y. & Greenwood L. Ry. 4-8½ g. 44 m. 8 lo. 53 c.
Stephen Smith, *Supt*..........Jersey City, N. J.
F. A. Stinard, *M. M*..........Pompton, N. J.
(2) N.Y., Pa & O. Div.: 4-8½ g. 565 m. 221 lo. 7,794 c.
Chas. Paine, *Gen. Supt*..........Cleveland, Ohio.
J. H. Holway, *Pur. Agt*..........Cleveland, Ohio.
Wm. Fuller, *Supt. M. P*..........Cleveland, O.
S. V. Smith, *Asst. Gen. M. C. B.*...Kent, Ohio.
E'n Div.: A. L. Dunbar, *Supt*......Meadville, Pa.
J. A. Cooper, *M. M*..........Meadville, Pa.
D. S. Dockstader, *M. C. Rep*...Meadville, Pa.
W'n Div.: A. M. Tucker, *Supt*..........Galion, O.
Wm Hill, *M. M*..........Galion, O.
Geo. Wilson, *For. Car Rep*....Galion, Ohio.
Maho'g Div.: N. F. Wood, *Supt*.....Cleveland, O.
N. Wright, *M. M*..........Cleveland, O.
C. N. Thorp, *M. C. Rep*..........Cleveland, O
New York, New Haven & Hartford R. R.
4-8½ g. 203 m. 123 lo. 2,768 cars.
E. M. Reed, *V. P. & Gen. Supt.* New Haven, Ct.
R. N. Dowd, *Pur. Agt*..........New Haven, Ct.
John Henney, Jr., *Supt. M.P.*..New Haven, Ct.
N. Y. & N. H. Div.: W. H. Stevenson, *Supt*...N. Y.
Shore Line and Air Line Divs.:
W. A. Waterbury, *Supt*.....New Haven, Ct.
Jas. Denver, *M. C. B*..........New Haven, Ct.
Hart. Div.: C. S. Davidson, *Supt*....Hartford, Ct.
O. C. Lackey, *M. M*..........Hartford, Ct.
Jno. Whitmore, *For. C. Dept*...Hartford, Ct.
N.Y., Ontario & Western Ry. (*See N. Y., W. Sh. & Buf.*)
N. Y., Pittsb'h & Chicago. 4-8½ g. 20 m. 2 lo. 32 c.
Geo. W. Dixon, *Supt*..........New Galilee, Pa.
H. I. Hanna, *Pur. Agt*..........Pittsburgh, Pa.
N.Y., Pennsylvania & Ohio R. R. (*See N. Y., L. E. & W.*)
New York, Philadelphia & Norfolk R. R.
4-8½ g. 10 m. 1 lo. 4 cars.
H. W. Dunne, *Supt*..........Cape Charles, Va.
New York, Providence & Boston R. R.
4-8½ g. 83 m. 29 lo. 430 cars.
J. B. Gardner, *Supt*..........Providence, R. I.
J. L. Hayden, *Pur. Agt*.....Stonington, Conn.
Geo. H. Griggs *M. M. & C. B.*.Providence, R. I.
N. Y., Susqueh'na & W'n. 4-9 g. 147 m. 33 lo. 1,469 c.
F. A. Potts, *Gen. Man*..........New York, N. Y.
C. D. McKelvey, *Supt*..........Jersey City, N. J.
C. T. Demarest, *Pur. Agt*.....New York, N. Y.
W. C. Ennis, *M. M. & C. B*...Wortendyke, N. J.
New York, Texas & Mexican Ry.
4-8½ g. 92 m. 6 lo. 95 cars.
Allen McCoy, *Gen. Man*..........Victoria, Tex.
J. G. Conlon, *M. M*..........Victoria, Tex.
New York, West Shore & Buffalo.
4-8½ g. 850 m. 177 lo. 7,291 c.
J. D. Layng, *Gen. Man*..........New York, N. Y.
C. W. Bradley, *Gen. Supt*.....Weehawken, N.J.
P. S. Bemis, *Pur. Agt*..........New York, N. Y.
R. H. Soule, *Supt. M. P*..........Frankfort, N. Y.
H.R.Div.: J. P. Bradfield, *Act. Supt.*, Weehawken, N.J.
Thos. Oldcorn, *M. M*.....New Durham, N. J.
Buff. Div.: D. B. McCoy, *Supt*.....Newark, N. Y.
N. Falls Div.: W. J. Murphy, *Supt.* Buffalo, N. Y.
Coeymans to Newark.
Jas. M. Boon, *M. M*..........Frankfort, N. Y.
Newark to Buffalo.
Geo. W. West, *M. M*..........East Buffalo, N. Y.
New York, Ontario & Western.
J. E. Childs, *Gen. Supt*..........New York, N. Y.
N. Y. Woodhaven & Rockaway R. R. (*See Long Is.*)
N. Y. & Greenwood Lake Ry. (*See N. Y., L. E. & W.*)
N. Y. & Manhattan Beach Ry. (*See Long Island.*)
New York & Long Branch R. R. (*See Phil. & Read.*)
New York & New England R. R.
4-8½ g. 473 m. 145 lo. 3,959 cars.
W. H. Turner, *Gen. Supt*..........Boston, Mass.
W. W. McKim, *Pur. Agt*..........Boston, Mass.
J. B. Henney, *Supt. M. P*..........Boston, Mass.
W. H. Griggs, *M. M*..........Norwood, Mass.
Elias E. Pratt, *M. C. B*..........Norwood, Mass.
East Div: E. G. Allen, *Supt*..........Boston, Mass.
Nor. Div.: P. St. M. Andrews, *Supt*...Norwich, Ct.
S. F. Whaley, *M. M*..........Norwich, Ct.
Prov. Div.: L. W. Palmer, *Supt*..Providence, R. I.
Hfd. Div.: E. Holbrook, *Supt*..........Hartford, Ct.
E. M. Humstone, *M. M*..........Hartford, Ct.
West'n Div.: C. H. Platt, *Supt*.....Fishkill, N. Y.
Woons'kt Div.:
E. N. Tucker, *Supt*..........Needham, Mass.
New York & Sea Beach R. R. 4-8½ g. 6 m. 6 lo. 41 c.
W. O. McDowell, *Gen. Man*...New York, N. Y.
C. W. Douglass, *Gen. Supt*...Bay Ridge, N. Y.
Newark, Somerset & Straitsville R. R. (*See B. & O.*)
Newburg, Dutchess & Conn. R. R. 4-8½ g. 59 miles.
C. L. Kimball, *Gen. Supt*.....Matteawan, N. Y.
W. G. Van Buskirk, *M. M. & C. B.*, Dutchess Junction, N. Y.
Newfoundland Ry. 3-6 g. 45 m. 7 lo. 41 c.
C. X. Hobbs, *Gen. Man*..........St. John's, N'f'd

Norfolk Southern R. R. 4-8½ g. 74 m. 7 lo 182 c.
M. K. King, *Gen. Man. & Pur. Agt.* Norfolk, Va.
J. S. Whitworth, *M. M. & C. B.* ....Norfolk, Va.
Norfolk & Ocean View R. R. & Hotel Co.
3 g. 8 m. 2 lo. 9 cars.
W. H. Taylor, *Pres*.................Norfolk, Va.
Norfolk & Va. Beach R. R. 3 g. 18 m.
J. M. Dickey, *Gen. Man*....... ...Norfolk, Va.
Norfolk & Western R. R. 5 g. 486 m. 82 lo. 1,779 c.
Jos. H. Sands, *Gen. Supt*... ....Roanoke, Va.
S. B. Haupt, *Supt. M. Power*.... Roanoke, Va.
East Div.: N. M. Osborne, *Supt*.....Norfolk, Va.
West Div.: Frank Huger, *Supt*..Lynchburg, Va.
North-Eastern R. R. of Ga. 5 g. 72 m. 2 lo. 20 cars.
H. R. Bernard, *Supt*................Athens, Ga.
North-Eastern R. R. (S. C.) (*See Wil. & Wel.*
North Pacific Coast R. R. 3 g. 84 m. 12 lo. 320 cars.
Gen. Supt..........San Rafael, Cal.
W. F. Russell, *Pur. Agt* ....San Francisco, Cal.
E. L. Reese, *M. M*.. ... .Saucelito, Cal.
North Shore Ry. 4-8½ g. 209 m. 21 lo. 564 c.
W. Wainwright, *Gen. Man* .....Montreal, Can.
A. Davis, *Supt. & Pur. Agt*.......Quebec, Can
Northern (N. H.), and Concord & Claremont Rys.
(*See Boston & Lowell.*)
Northern (N. J.) R. R. (*See N. Y., L. E. & W'n.*)
Northern Central Ry. (*See Penna. R. R. (6) Div.*)
North'n Pacific R. R. 4-8½ g. 2,646 m. 391 lo. 9,897 c.
T F. Oakes, *Gen. Man*.... .....St. Paul, Minn.
John H. Ames, *Gen. Pur. Agt*..St. Paul, Minn.
Geo. W. Cushing, *Supt. M. P., M. & R. S.* do.
J. C. Barber, *M. C. B*..... ....Brainerd, Minn.
(1) E'n Div.: J. T. Odell, *A. Gen. Man.* St. Paul, Minn.
1st Gr. Div.: M. C. Kimberly, *Supt.* Brainerd, Minn.
H. J. Small, *M. M* ....Brainerd, Minn.
M. C. B......Brainerd, Minn.
2d Gr. Div.: J. M. Graham, *Supt.* Jamestown, Dak.
C. C. Quinn, *M. M*.................Fargo, Dak.
A. Bardsley, *M. M*..............Mandan, Dak.
F. Greene, *A. Supt*.......... ..Mandan, Dak.
3d Gr. Div.: S. R. Ainslie, *Supt*.. Glendive, Mont.
S. L. Bean, *M. M* ....Glendive, Mont.
C. W. Rossiter, *M. M*.......Livingston, Mont.
(2) W'n Div.: J. M. Buckley, *Asst. Gen. Man.*
New Tacoma, W. T
W. T. Small, *A. S. Mach*.......Tacoma, W T.
4th Gr. Div.: F. W. Gilbert, *Supt.* Missoula, Mont.
F. P. Weymouth, *Supt*....... .. Sprague, W. T.
Wm. Garlock, *M. M*.........Missoula, Mont
J. Evans, *M. M*....... ....Sprague, W. T.
5th Gr. Div.: Otis Sprague, *Supt*...Tacoma, W. T
Northern & North-W'n Rys. 4-8½ g. 378 m. 50 lo. 1,195 c.
James Webster, *Supt*..... ....Toronto, Can.
W. C. Schreber, *Pur. Agt*.......Allandale, Can
P. Clarke *M. M*... .... .Toronto Can.
Northern & Western Ry. 4-8½ g. 50 m
J. B. Snowball, *Man*.......... ..Chatham, N. B,
Nova Scotia Ry. 4-8½ g. 79 m. 9 lo. 268 c.
C. A. Scott, *Gen. Man*.. ...New Glasgow, N. S.
M. F. Punch, *M. M*........New Glasgow, N. S.

O

Ogdensburg & Lake Champlain R. R.
4-8½ g. 130 m. 33 lo. 1,694 cars.
A. A. Gaddis, *Gen. Man*......Ogdensburg, N. Y
E. B. Burnham, *Pur. Agt*...Ogdensburg, N. Y.
Wm. A. Short, *M. M*........... ....Malone, N. Y.
H. S. Leach, *Master Builder*. Ogdensburg, N. Y.
Ohio River R. R. 4-9 g. 9 lo. 350 cars.
C. L. Williams, *Asst. Supt.* Parkersburg, W. Va.
S. Litchworth, *M. M.* .....Parkersburg, W. Va.
Ohio Southern R. R.:
W. H. Van Tassel, *Supt*....... .Springfield, O.
John King, *M. M* ....Springfield, O.
Ohio & Mississippi Ry. 4-9 g. 616 m. 113 lo. 2,501 cars.
W. W. Peabody, *Pres. & Gen. Man.* Cincinnati, O.
G. E Atwood, *Pur. Agt*..........Cincinnati, O.
F. W. Stapf, *Gen. M. M*... .... Vincennes, Ind.
Cin. Div.: C. B. Cole, *Supt*..... ....Seymour, Ind.
J. P. Coulter, *Gen. M. C. B*.... ..Aurora, Ind.
E. E. Jenks, *A. Gen. For*......Seymour, Ind.
W. L. Hoffecker, *Ass't M. M* Vincennes, Ind.
A. N. Bradley, *M. C. P*.........Cochran, Ind
St. L. & Sp. Div.: C. M. Stanton, *Supt.* St. Louis, Mo.
J. W. Stokes, *M. M.* (Spring. Div.)..Pana, Ill.
Louisv. Div.: C. B. Cole, *Supt* . .Louisville, Ky
Old Colony R. R. 4-8½ g. 470 m. 124 lo. 3,527 cars.
J. R. Kendrick, *Gen. Man*........Boston, Mass.
R. W. Husted, *Pur. Agt*...........Boston, Mass.
Jas. N. Lauder, *Supt. R. S*...... Boston, Mass.
Sam. Stevens, *S. Br. & Bld'gs*....Boston, Mass.
Main Li. Div.: J. H. French, *Supt*...Boston, Mass.
F. M. Twombly, *M. M*......... ..Boston, Mass.
Cape Cod Div.: C. H. Nye, *Supt*..Hyannis, Mass.
F. M. Twombly, *M. M*..............Boston, Mass.
No. Div.: S. A. Webber, *Supt*....Fitchburg, Mass.
A. W. Twombly, *M. M*.... ....Taunton, Mass.
Olympia & Chehalis Val. R. R. 3 g. 15 m.
Otis Sprague, *Supt* ....Olympia, W. T.
Oregon Ry. & Navigation Co.
3 & 4-8½ g. 807 m. 72 lo. 1,611 cars.
C. H. Prescott, *V. P. & Gen. Man.* Portland, Ore.
F. T. Dodge, *Supt.* (Riv. Div.)....Portland, Ore.
H. S. Rowe, *Supt.* (Ry Div.).......Portland, Ore.
J. M. Drake, *Pur. Agt*.......... Portland, Ore.
Goodall, Perkins & Co., *Supt*. (Ocean Div.)
San Francisco, Cal.
C. C. Hobart, *Gen. M. M*.......The Dalles, Ore
P. Carlsen, *Foreman*..........The Dalles, Ore.
Oregon & California R. R. 4-8½ g. 449 m. 43 lo. 626 c.
R. Koehler, *Man*..................Portland, Ore
J. Brandt, *Gen. Supt* ....Portland, Ore.
W. T. Bodley, *Pur. Agt*..........Portland, Ore.
A. Brandt, *M. M*.. ....Portland, Ore
Ottumwa & Kirkville Ry. 4-8½ g. 13 m.
J. A. Kebler, *Supt* ....Ottumwa, Ia.
Owensboro & Nashville R. R. 5 g. 44 m. 3 lo. 70 c.
W. M. Newbold, *Supt*.........Owensboro, Ky.
J. T. Edwards, *M. M. & C. B* .Owensboro, Ky.
Oxford & Henderson R. R. 4-8½ g. 13 m. 2 lo. 11 c.
James A. White, *Gen. Supt*...Henderson, N. C.
James E. Lawrence, *M. M* ...Henderson, N. C.

P

Pacific Coast Ry. 3 g. 64 m.
J. M. Fillmore, *Manager* San Luis Obispo, Cal.
John Walch, *M. M. & C. B.* do.
Painesville & Youngstown Ry. 3 g. 65 m. 7 lo. 319 c.
R. K. Paige, *Rec. & Man*.........Painesville, O.
J. A. Newcome, *Supt. R. S*.... ..Painesville, O.
Panama R. R. 5 g. 48 m. 14 lo. 2,200 cars.
G. A. Burt, *Gen. Supt*..... Aspinwall, U. S. Col.
E. Z. Penfield, *Pur. Agt*.......New York, N. Y.
Jos. Beaumont, *M. M*.. .Aspinwall, U. S. Col
Passumpsic R. R. 4-8½ g. 147 m. 28 lo. 1,101 cars.
E. Raymond, *Pres. & Pur. Agt*. Boston, Mass.
H. E. Folsom, *Supt*.............Lyndonville, Vt.
L. L. Brigham, *M. M*........ . Lyndonville, Vt.
L. F. Woodard, *M. C. B* ......Lyndonville, Vt.
Paw Paw and Toledo & South Haven R. Rds.
3 g. 20 m. 3 lo. 16 cars.
John Ihling, *Supt*...... ....Lawton, Mich.
Peach Bottom R. R. 3 g. 55 m. 6 lo. 52 cars.
B. B. Newton, *Supt. & Pur. Agt*...Oxford, Pa.
E. H. Williams, *M. C. B*...............York, Pa.
W. P. Kirk, *M. M*......................Oxford, Pa.
Pemigewasset Valley R. R. 4-8½ g. 21 m. 2 lo. 127c.
J. Thomas Vose, *Pres*........ Boston, Mass.
Pennsylvania Co.'s (5) Roads
4-9 g. 3,222 m. 920 lo. 32,809 cars.
Gen. Divs. (1), (2), (3), (4) and (5).
Wm. A. Baldwin, *Gen. Man*... Pittsburgh, Pa.
John Thomas, *Gen. Supt*.... Pittsburgh, Pa.
Wm. Mullins, *Gen. Pur. Agt*....Pittsburgh, Pa.
Joseph Wood, *Supt. M. P*..... .Fort Wayne, Ind.
(1) Pittsburgh, Ft. Wayne & Chicago Ry.
4-9 g. 468 m. 288 lo. 8,023 cars.
E'n Div.: A. B. Starr, *Supt*......Allegheny, Pa.
Geo. J. Parkin, *M. M*..... ....Allegheny, Pa.
D. M. Peppard, *M. M*....... . Crestline, O.
W'n Div.: C. D. Law, *Supt*.....Ft. Wayne, Ind.
F. D. Casanave, *M. M*........Ft. Wayne, Ind.
A. H. Somers, *Gen. For. Shops*...Chicago, Ill.
(2) Ashtabula & Pittsburgh, and
(3) Erie & Pittsburg R. Rds. 221 m. 29 lo. 1,362 c.
John M. Kimball, *Supt*..Lawrence Junc., Pa.
J. A. Wood, *Gen. For. Shops*.......Erie, Pa.

(4) Cleveland & Pittsb'g R. R. 225 m. 97 lo. 3,534 c.
R. F. Smith, *Asst. Man*.... .....Cleveland, O.
Philip Bruner, *Supt*..............Wellsville, O.
W. F. Beardsley, *Mast. of Mach.* Wellsville, O.
(5) Nc-W'n Ohio Ry.: J. S. Morris, *Supt*...Toledo, O.
Pennsylvania R. R. Co.'s Roads. (7 Gen. Divs.)
4-9 g. 3,158 m. 1,459 loco. 66,816 cars.
Chas. E. Pugh, *Gen Man*......Philadelphia, Pa.
Enoch Lewis, *Pur. Agt*.........Philadelphia, Pa.
S. M. Provost, *Supt. Trans*...Philadelphia, Pa.
Theo. N. Ely, *Gen. S. M. P*........Altoona, Pa.
Pennsylvania R. R. Divs.
4-9 g. 1,213 m. 705 lo. 46,819 cars.
Robt. E. Pettit, *Gen. Supt*. ... ..Altoona, Pa.
Frank L. Sheppard, *Supt. M. P.*..Altoona, Pa.
G. W. Strattan, *M. M*. ....Altoona, Pa.
Jno. P. Levan, *Gen. Fore*. . ....Altoona, Pa.
Phila. Div.: Tho. Gucker, *Supt.* Philadelphia, Pa.
H. D. Garrett, *M. M*....W. Philadelphia, Pa.
I. W. Van Houten, *Gen. For*....W. Phila., Pa.
Schuylkill Div.:
Jas. Reed, *Supt*...... ....Reading, Pa.
Mid. Div.: O. E. McClellan, *Supt.* Harrisburg, Pa.
E. L. Caum, *M. M*..............Harrisburg, Pa.
Samuel W. Myers, *Gen. For.* Harrisburg, Pa.
Altoona Div.: J. B. Hutchinson, *Supt.* Altoona, Pa.
Pitts. Div.: Robert Pitcairn, *Supt*..Pittsburgh, Pa.
D. O. Shaver, *M. M*...........Pittsburgh, Pa.
J. G. Stewart, *Gen. For*.......Pittsburgh, Pa.
W. Pa. Div.: A. P. Kirtland, *Supt.* Blairsville, Pa.
Wm. B. Norris, *M. M*..........Blairsville, Pa.
M. H. Fails, *Gen. For*...........Blairsville, Pa.
Fred. Div.: Wilson Brown, *Supt*........York, Pa.
Tyrone Div.: S. S. Blair, *Supt*........Tyrone, Pa.
Lew. Div.: Wm. M. Phillips, *Supt.* Lewistown, Pa.
Bed. Div.: R. L. Holliday, *Supt*......Bedford, Pa.
Monong. Div.: David M. Watt, *Supt.* Pittsburgh, Pa.
Wm. Lininger, *M. M* ....Ormsby, Pa.
(2) United R. Rs. of N. J. Divs. 471 m. 330 lo. 4,041 c.
F. Wolcott Jackson, *Gen. St.* Jersey City, N. J.
H. S. Hayward, *Supt. M. P*...Jersey City, N. J.
David H. Baker, *Gen. For*...Jersey City, N. J.
N. Y. Div.: Jos. A. Crawford, *Supt.* Jersey City, N. J.
L. A. Bosdevex, *M. M.* ..Jersey City, N. J.
E. F. Bosdevex, *Gen. For*..Jersey City, N. J.
Belv. Div.: J. A. Anderson, *Supt.* Lambertv., N. J.
R. McDowell, *M. M*.......Lambertville, N. J.
Amboy Div.: W. N. Bannard, *Supt.* Camden, N. J.
Thos. Kerr, *M. M*....... ....So. Amboy, N. J.
P. S. Bogart, *Gen. For*......So. Amboy, N. J,
(2½) Camden & At. Rd.: 75 m. 18 l. 261 c.
A. G. Dayton, *Supt*............Camden, N. J.
Rufus Hill, *M. M*.. ....Camden, N. J.
Samuel Wills, *M. C. B*.... ..Camden, N. J.
(3) West Jersey R. R. 4-9 g. 188 m. 27 lo. 294 cars.
A. G. Dayton, *Gen. Supt*.........Camden, N. J.
W McAlister, *M. M*.... ....Camden, N. J.
C. C. Williams, *Gen. For*........Camden, N. J.
(4) Phila., Wilm. & Balt. R. R. 409 m. 128 lo. 1,882 c.
H. F. Kenney, *Gen. Supt* .....Philadelphia, Pa.
J. M. Wallis, *S. M. P*. ....Philadelphia, Pa.
H. D. Gordon, *M. M*........Wilmington, Del.
W. H. Lungren, *M. C. B*.... ..Wilmington, Del.
Cen. Div.: L. K. Lodge, *Supt*......... Media, Pa.
Del. Div.: I. N. Mills, *Supt*..........Clayton, Del.
Mu. Div.: H. H. Carter, *Supt*..Wilmington, Del.
(5) Phila. & Erie R. R. Divs.: 437 m. 110 lo. 3,089 c.
R. Neilson, *Gen. Supt*.... ..Williamsport, Pa.
Edw. D. Nelson, *Supt. Mo. Po.* Williamsport, Pa.
E'n. Div.: E. B. Westfall, *Supt.* Williamsport, Pa.
Sun. H. & W. Div: A. Walter, *Supt.; and*
H. K. Stout, *M. M*.... ... .Sunbury, Pa.
Mid. Div.: Tho. A. Roberts, *Supt*.....Renovo, Pa.
Wm. L. Holman, *M. M*..........Renovo, Pa.
West'n Div.: J. W. Reynolds, *Supt*.....Erie, Pa.
J. Gaskill, *M. M*......... ....Erie, Pa.
(6) Northern Central Ry. 4-9 g. 346 m. 152 lo. 6,610 c.
Robert Neilson, *Gen. Supt*...Williamsport, Pa.
Edw. D. Nelson, *Supt. M. P*..Williamsport, Pa.
A. W. Sumner, *Pur. Agt*... ....Baltimore, Md.
J. M. Coale, *M. M*................Baltimore, Md.
G. W. Demarest, *Gen. For*......Baltimore, Md.
Susq. Div.: E. B. Westfall, *Supt.* Williamsport, Pa.
Sham. Div.: A. Walter, *Supt*..... ..Sunbury, Pa.
Elm. & Can. Divs.: S. Meade, *Supt*..Elmira, N. Y.
Jas. Strode, *M. M*.... ....Elmira, N. Y.
J. C. Dyott, *Gen. For* ....Elmira, N. Y.
Sodus Bay Div.: S. Mead, *Supt.* Sodus Point, N. Y.
Baltimore Div.: H. W. Kapp, *Supt.* Baltimore, Md.
(7) Balt. & Pot. & Alex. & Fred. 125 m. 30 lo. 360 c.
H. F. Kenny, *Gen. Supt*.......Philadelphia, Pa.
A. W. Sumner, *Pur. Agt*........Baltimore, Md.
J. M. Wallis, *Supt. Mo. Po*....Philadelphia, Pa.
H. D. Gordon, *M. M*....... ....Wilmington, Del.
J. Lescallett, *For. Mach. Shop*. Washington, D. C.
R. F. Downs, *For. Car Shop*..Washington, D. C.
Penn. Coal Co.'s R. R. 4-3 g. 67 m. 23 eng. 3,271 c.
J. B. Smith, *Gen. Supt* ..... .Dunmore, Pa
And. Crane, *M. M*. ....Dunmore, Pa.
Geo. W. Simpson, *M. C. B*........Dunmore, Pa.
Pennsylvania, Slatington & New England R. R.
In progress. 4-8½ g. 18 m. 1 lo. 20 cars.
C. H. Stanton, *Supt*........... New York, N. Y.
Pennsylvania & Erie R. R.—Early Branch.
C. R. Early, *Gen. Supt*.......... Ridgeway, Pa.
Pensacola & Atlantic R. R. 5 g. 161 m. 9 lo. 67 cars.
E. O. Saltmarsh, *Gen. Supt*.....Pensacola, Fla.
W. D. Robb, *M. M*............ .Pensacola, Fla.
Pensacola & Perdido R. R. 5 g. 10 m. 5 lo. 93 cars.
B. F. Simmons, *Pr. & Supt*.... Pensacola, Fla.
H. W. Simmons, *Pur. Agt*......Pensacola, Fla.
J. C. Schutte, *M. M*.............Pensacola, Fla.
People's Ry. 4-8½ g. 15 m. 2 lo. 14 cars.
W. D. Pollard, *Supt*....... ......Pottsville, Pa.
Peoria, Decatur & Evansville Ry.
4-8½ g. 254 m. 30 lo. 1,660 cars.
G. L. Bradbury, *Gen. Man*.... .... Peoria, Ill.
P. Reilly, *M. M*..................Mattoon, Ill.
Peoria & Farmington R. R. (*See Cen. Ia.*)
Peoria & Pekin Union Ry. 4-8½ g. 20 m. 12 lo. 106 c.
Thos. B. Burnett, *Gen. Supt. & P. A.* Peoria, Ill.
O. W. Bell, *Supt* ....Peoria, Ill.
R. F. Hurd, *M. M. & C. B*.. ....Peoria, Ill.
Perkiomen R. R. 4-8½ gauge 39 miles.
D. B. Clack, *Supt*.....Perkiomen Junction, Pa.
H. Boyd, *Pur. Agt*.............Norristown, Pa.
Petersburg R. R. 4-8½ g. 64 m. 10 lo. 133 cars.
R. M. Sully, *Supt*....... .....Petersburg, Va.
Geo. F. Jones, *Pur. Agt*.... ...Petersburg, Va.
J. R. Woodard, *M. M*.... .....Petersburg, Va.
Phila., Wilmington & Balt. R. R. (*See Penna. R. R.*)
Peterborough & Hillsborough. (*See Northern, N. H.*)
Philadelphia, Newtown & N. Y. R. R. 4-8½ g. 23 m.
W. M. Geary, *Supt*...........Philadelphia, Pa.
Phila. & Atlantic City R. R. 4-8½ g. 54 m.
John E. Wootten, *Gen. Man.* Philadelphia, Pa.
W. Bertolet, *Supt*......... ...Philadelphia, Pa.
W. S. Wilson, *Pur. Agt*.......Philadelphia, Pa.
Philadelphia & Erie R. R. (*See Penna. R. R.; (5) Div.*)
Philadelphia & Reading R. R.
4-8½ g. 1,588 m. 940 lo. 57,477 cars.
John E. Wootten, *Gen. Man*..Philadelphia, Pa.
W. S. Wilson, *Pur. Agt*......Philadelphia, Pa.
Geo. Eltz, *Supt. Trans*.. .... Reading, Pa.
L. B. Paxson, *Eng. of Mach* ...... Reading, Pa.
No. Penn. & Bound Brook Div.:
I. A. Sweigard, *Supt*........Philadelphia, Pa.
Mahanoy & Susquehanna Div.:
J. H. Olhausen, *Supt*...........Palo Alto, Pa.
D. C. Reinhart, *Asst. Supt*. ...Catawissa, Pa.
A. A. Hesser, *Asst. Supt* Mahanoy Plane, Pa.
Schuylkill & Susquehanna Br.:
H. W. Tracy, *Supt* ... .Pine Grove, Pa.
Reading & Columbia R. R.:
A. M. Wilson, *Supt* ....Columbia, Pa.
N. J. Central and N. J. Southern Divs.:
W. W. Stearns, *Supt*.... . Elizabeth, N. J.
Lehigh & Susquehanna Div.:
G. W. Twining, *Supt* ... Mauch Chunk, Pa.
Pittsburgh, Bradford & Buffalo Ry. (*See Pitts. & West.*)
Pittsburgh, Chartiers & Youghiogheny R. R.
4-8¾ g. 19 m.
Geo. S. Griscom, *Gen. Man*.....Pittsburgh, Pa.
Pittsburgh, Cincinnati & St. Louis Ry (5 Gen. Divs.)
4-9 g. 91? m. 239 lo. 7,133 cars.
James McCrea, *Manager*.........Columbus, O.
Wm. Mullins, *Pur. Agt*.... ...Pittsburgh, Pa.
Edward B. Wall, *Supt M. P*.......Columbus, O.

(1) P., C. & St. L. Div.: E. B. Taylor, *Supt.* Pittsburgh, Pa.
C. B. Street, *M. M*.. ....Dennison, O.
J. M. Copeland, *G. F. Car Shops.* Steubenville, O.
(2) C. & M. V. Div.: W. F. Black *Supt*..Zanesville, O.
Leroy Kells, *M. M*.. . ...Lancaster, O.
Wm. Meikle, *Gen. For*......... Lancaster, O.
Daniel Jewell, *Gen. F. Car Shops.* Lancaster, O.
(3) Li. Mi. Div.: Ralph Peters, *Supt*....Cincinnati, O.
Leroy Kells, *M. M*..............Cincinnati, O.
Jos. Underwood, *G. F. Car Shops.* Cincinnati, O.
(4) J. M. & I. R. R.: E. W. McKenna, *Supt.* Louisville, Ky.
Wm. Swanston, *M. M*.. ...Indianapolis, Ind.
Edw. Austin, *G. F. C. Shops*. Indianapolis, Ind.
(5) Indianapolis & Vincennes R. R.
J. J. Turner, *Supt*.. ....Indianapolis, Ind.
Pittsburgh, Cleveland & Toledo R. R.
4-8¾ g. 78 m. 18 lo. 525 cars.
C. H. Andrews, *Pres*...........Youngstown, O.
W. F. Hofecker, *M. M*.. ...Youngstown, O.
Pittsburgh, Ft. Wayne & Chicago Ry. (*See Penna. Co.*)
Pittsburgh Southern Ry. (*See Balt. & O.*)
Pitts. & Castle Shannon R. R. 3-4 g. 9 m. 5 lo. 428 c.
Gen. Supt... Pittsburgh, Pa.
Holmes Ward, *M. M* ....Castle Shannon, Pa.
Wm. E. Long, *M. C. B* .... Pittsburgh, Pa.
Pitts. & Lake Erie R. R. 4-8¾ g. 70 m. 30 lo. 1,528 c.
W. C. Quincy, *Gen. Man*........Pittsburgh, Pa.
D. H. Hostetter *Pur. Agt*.... . Pittsburgh, Pa.
R. W. Jones, *Mast. Trans*......Pittsburgh, Pa.
S. W. Haines, *M. M*...... ......Pittsburgh, Pa.
Pittsburgh, McKeesport & Youghiogheny.
4-8¾ g. 57 m. 19 lo. 278 cars.
W. C. Quincy, *Gen. Man*...... Pittsburgh, Pa.
R. W. Jones, *M. of Trans*......Pittsburgh, Pa.
S. W. Haines, *M. M* .... Pittsburgh, Pa.
Pitts. & Western R. R. 3 & 4-8½ g. 274 m. 50 lo. 1,407 c.
Pitts., Bradford & Buff. Ry. 3 g. 93 m. 8 lo. 163 c.
Tho. M. King, *Gen. Man*.........Allegheny Pa.
J. T. Johnson, *Supt*.... ....Allegheny, Pa.
J. Morton Hall, *Pur. Agt*..... ..Allegheny, Pa.
W. M. Flahavhan, *M. M*........Allegheny, Pa
Pontiac, Oxford & Pt. Austin R. R. 100 m.
Geo. W. Debevoise, *Pr. & Gen. Man.* N. York, N. Y.
Jas. Houston, *Gen. Supt*.......... ..Pontiac, Mich.
Port Huron & No.-Western Ry. 3 g. 218 m. 14 lo. 288 c.
H. McMorran, *G. Man. & P. A.* Port Huron, Mich.
I. R. Wadsworth, *Supt*.. ...Port Huron, Mich.
Chas. Diefenbach, *M. M*.....Port Huron, Mich.
Benj. Hillier, *M. C. B*........Port Huron, Mich.
Port Jervis & Monticello R. R. 4-8½ g. 24 m. 3 lo. 13 c.
J. M. Warner, *Gen. Man*.....Port Jervis, N. Y.
Port Royal & Augusta. 5 g. 180 m. 16 lo. 310c.
and Augusta & Knoxville Rys.
J. N. Bass, *Supt*..... ....Augusta, Ga.
T. F. Warwick, *M. M. & M. C. B.* Augusta, Ga.
Portland & Ogdensburg. 4-8½ g. 110 m. 11 lo. 311 c.
J. Hamilton, *Gen. Supt. & P. A*..Portland, Me.
M. M....... ....Portland, Me.
W. G. Brewer, *M. C. B*... . ...Portland, Me.
Portland & Rochester R. R. 4-8½ g. 52 m. 8 lo. 226 c.
J. W. Peters, *Supt. & Pur Agt*...Portland, Me.
E. H. C. Tompson, *For. of Mach*..Portland, Me.
David Dow, *For. of Car Repairs*.Portland, Me
Potomac, Fred.'g & Pied. R. R. 3 g. 38 m. 2 lo. 38 c.
W. H. Richards, *Gen. Man.* Fredericksburg, Va.
W. J. Sweigard, *M. M* ....Fredericksburg, Va.
Pough., Hart. & Bos. R. R. 4-8½ g. 45 m. 4 lo. 65 c.
J. A. Perkins, *Supt*.........Poughkeepsie, N. Y.
John L. Donaldson, *M. M.* Poughkeepsie, N. Y.
Pratt Coal & Iron Company's R. R. 5 g. 20 m. 4 lo. 184 c.
W. L. Gude, *Gen. Man*........Pratt Mines, Ala.
Prescott & Thirty-Fifth Parallel R. R.
4-8½ g. 77 miles in progress.
Samuel A. Henszey, *Gen. Man*..Prescott, Ariz.
Prince Edward Island Ry. 3-6 g. 220 m. 21 lo. 350 c.
Jas. Coleman, *Supt. & Pur. Agt.;*
Jos. Unsworth, *M. Supt. & Storekeeper;* and
D. M. Fraser, *M. C. B*.. .Charlottetown, P. E. I.
Profile & Franconia Notch R. R. 3 g. 15 m. 3 lo. 18 c.
Emmons Raymond, *Pur. Agt*.... Boston, Mass.
C. H. Greenleaf, *Supt*......Profile House, N. H.
Prospect Park & Coney Island R. R.
4-8½ g. 15 m. 8 lo. 123 cars.
And. R Culver, *Pres*...... ....Brooklyn, N. Y.
R. Schermerhorn, *Supt* ....Brooklyn, N. Y.
Martin Painter, *M. M*...........Brooklyn, N. Y.
Prov., Warren & Bristol R. R. 4-8½ g. 19 m. 6 lo. 79 c.
Waterman Stone, *Supt*.. .. ..Providence, R. I.
Rufus Smith, *M. M. & C. B*....... ..Bristol, R. I.
Prov. & Springfield R. R. 4-8½ g. 23 m. 4 lo. 92 c.
Wm. Tinkham, *Gen. Man*.....Providence, R. I
G. T. Richardson, *M. M*........Providence, R. I.
Prov. & Worcester. 4-8½ g. 50 m. 37 lo. 1,253 c.
W. E. Chamberlain, *Supt* .....Providence, R. I.
A. Griggs, *Supt. L. & C. D*....Providence, R. I.
Pullman's Palace Car Co. 1,100 passenger cars.
Geo. M. Pullman, *Pres*...... .....Chicago, Ill.
H. Porter, *V. Pres*...... ....New York, N. Y.
Geo. F. Brown, *Gen. Man*...... ...Chicago, Ill.
Wm. A. Angell, *Pur. Agt*.... ....Chicago, Ill.
S. W. Brotzfield, *Asst. Pur. Agt.* New York, N. Y.
A. Rapp, *Man.* (Chicago Works)...Chicago, Ill.
H. L. Spaulding, *Man.* (Det. Shops). Detroit, Mich.
E. A. Benson, *Supt. Shops*... ... St. Louis, Mo.

Q

Quebec Central Ry. 4-8½ g. 156 m. 10 lo. 267 cars.
J. R. Woodward, *Gen. Man*..Sherbrooke, P. Q.
A. Steele, *Supt*.............. Sherbrooke, Que.
R. D. Morkill, Jr., *Pur. Agt*..Sherbrooke, P. Q.
Jas. Seiveright, *M. M* ....Sherbrooke, P. Q.
Quebec, Montreal, Ottawa & Occidental Ry.
4-8½ g. 354 m. 36 lo. 993 cars.
L. A. Senecal, *Gen. Supt*........Quebec, Can.
Quebec & Lake St. John Ry. 4-8½ g. 36 m. 3 lo. 55 c.
J. G. Scott, *Manager*..................Quebec, Can.
Frank Fournier, *Supt*... ...St. Raymond, P. Q.
John T. Eames, *M. M*.. ....St. Raymond, P. Q.

R

Raleigh & Augusta Air-Line: Carolina Central Raleigh & Gaston R. Rs. 4-8½ g. 446 m. 52 lo. 1,052 c
John C. Winder, *Gen. Man. & P. A.* Raleigh, N. C.
Raleigh Rds. 4-8½ g. 200 m. 27 lo. 638 cars.
B. R. Harding, *Supt. of Mach.* Raleigh, N. C.
Carolina Cen. R. R. 4-8½ g. 242 m. 26 lo. 431 c.
L. C. Jones, *Supt*... . ..Wilmington, N. C.
James Maglenn, *M. of Mach.* Laurinburg, N. C.
S. R. Ethridge, *M. C. B* ...Laurinburg, N. C.
Rhinebeck & Connecticut. (*See Hart. & Ct. Wn.*)
Richmond, Fredericksburg & Potomac R. R.
4-9 g. 81 m. 15 lo. 149 cars.
E. T. D. Myers, *Gen. Supt* .. Richmond, Va.
T. L. Courtney, *Asst. Supt* ..Richmond, Va.
H. Kuhn, *M. M*.......... ...Richmond, Va.
W. H. Trainham, *M. C. B* ...Richmond, Va.
Rich., York River & Ches. R. R. (*See Rich. & Dan.*)
Richmond & Alleghany R. R. 4-9 g. 261 m. 19 lo. 837c.
Decatur Axtell, *Rec. & Gen. Man.* Richmond, Va.
M. Sweeney, *Pur. Agt*.... ...Richmond, Va
Geo. D. Harris, *M. M. & C. B*. ..Richmond, Va.
Richmond & Danville R. R. Co.'s Roads.
1,736 miles 218 loco. 3,833 cars.
A. L. Rives, *Gen. Man* ....Richmond, Va.
Peyton Randolph, *As. G. Man*..Richmond, Va.
J. P. Minetree, *Pur. Agt*....... Richmond, Va.
R. D. Wade, *Supt. Mo. Po*....Richmond, Va.
(1) Rich. & Dan. R. R. 5 g. 847 m. 131 lo. 2,687 cars.
Rich. & Dan. Div.: 5 g. 320 m. 80 lo. 1,797 c
Wm. H. Green, *Supt*...... ....Richmond, Va.
M. M... ....Richmond, Va.
J. B. Vaughan, *For. Car Sh*...Richmond, Va.
North Carolina Div. 5 g. 223 m. 22 lo. 268 cars.
A. B. Andrews, *Supt*.... .....Raleigh, N. C.
W. H. Turrentine, *M. M.* Comp'y's Shops, N. C.
J. C. Holt, *For. Car Sh.* Comp'y's Shop N. C.
Atlanta & Char. Air Line. 5 g. 286 m. 31 lo. 415 c.
Narrow-Gauge Branches. 3 g. 80 m. 5 lo. 41 c.
Edmund Berkley, *Supt*..... ....Atlanta, Ga.
T. W. Gentry, *M. M*. .. ..Atlanta, Ga.
Z. T. Smith, *For. Car Sh* ......Atlanta, Ga.
(2) Charlotte, Col. & Aug. R. R. 5 g. 239 m. 22 lo. 287 c.
G. R. Talcott, *Supt*..........Columbia, S. C.
J. H. Green, *M. M.* (2 roads)...Columbia, S. C.
(3) Columbia & Greenville R. R. 5 g. 297 m. 22 l. 224 c.
G. S. Talcott, *Supt*..............Columbia, S. C.
J. O. Meredith, *For. E. & C. Rep*.. do.

(4) Virginia Midland Ry. 4-8½ g. 353 m. 41 lo. 631 c.
Supt. Alexandria, Va.
H. M. Smith, *M. of M*.......Alexandria, Va.
J. T. Nalls, *M. C. B*. ...... .Alexandria, Va.
Richmond & Petersburg R. R. 4-8½ g. 25 m. 8 lo. 132 c.
J. R. Kenly, *Supt*..... ....Richmond, Va.
John O'Brien, *M. M*..............Richmond, Va.
Rio Grande R. R. 3-6 g. 22 m. 3 lo. 40 cars
M. J. Gomila, *Rec. & Gen. Man.* Brownsville, Tex.
G. W. Rendall, *M. M*........ ... Brownsville, Tex.
M. Markwood, *M. C. B*..... . .Brownsville, Tex.
Rio Grande & Pecos Ry. 4-8½ g. 27 m. In progress.
W. W. Hungerford, *Man*..........Laredo, Tex.
Rochester & Lake Ontario Ry. 4-8½ g. 6 m. 2 lo. 10 c.
N. B. Ellison, *Man*.............Rochester, N. Y.
Rochester & Pittsb'g. R. R. 4-8½ g. 260 m. 60 lo. 3,296 c.
Geo. E. Merchant, *Gen. Man*...Rochester N. Y.
J. T. Gardiner, *Gen. Supt*.......Buffalo, N. Y.
C. W. Mills, *Supt. M. P*... .. Rochester, N. Y
Rock Island & Mercer County R. R., and
Rock I'd & Peoria Ry. 4-8½ g. 113 m. 13 lo. 357 c.
R. R. Cable, *V.-P. & Gen. Supt*.....Chicago, Ill
R. I. & P. Ry.:
H. B. Sudlow, *Supt. & P. A*....Rock Island, Ill.
Joseph Elder, *M. M*..................Peoria, Ill.
R. I. & M. C. Rd.: H. B. Sudlow, *Supt.* R'k Island, Ill.
J. H. Parks, *M. M*............ .Rock Island, Ill.
Rogersville & Jefferson R. R. 5 g. 16 m. 1 lo. 6 cars.
C. M. Leuty, *Supt*........... Rogersville, Tenn.
Rome (Ga.) R. R. 5 g. 20 m. 2 lo. 17 cars
Eben Hillyer, *Pres. & Supt*........ Rome, Ga.
O. W. Harbin, *M. M*.... .... Rome, Ga.
Rome, Watertown & Ogdensburg R. R.
4-8½ g. 418 m. 61 lo. 1,831 cars.
H. M. Britton, *Gen. Man. & P. A.* Oswego, N. Y.
Geo. H. Haselton, *S. M. P. & M.* Oswego, N. Y.
E'n Div.: J. D. Remington, *A. Supt.* Watertown, N. Y.
W'n Div.: W. H. Chauncey, *A. Supt.* Oswego, N. Y
Roodhouse & Scottsville Ry. In progress.
Geo. P. Merrill, *Gen. Man*..........Chicago, Ill.
Rumford Falls & Buckfield R. R. 4-8½ g. 29 m. 2 l. 62 c.
L. L. Lincoln, *Supt. & Pur. Agt*...Canton, Me.

S

Sabine & East Texas Ry. (*See Cen. Pac.*)
Sacramento & Placerville R. R. (*See Cen. Pac.*)
Saginaw Bay & Northw'n R. R. 4-8½ g. 31 m. 6 lo. 136 c.
J. Jackson, *Gen. Man*.... ...Pinconning, Mich.
F. T. Lillote, *Act. Pur. Agt*...Pinconning, Mich.
Edward Keeler, *M. M*........Pinconning, Mich.
Saginaw, Tuscola & Huron R. R.
3 g. 50 m. 5 lo. 85 cars.
M. B. Wilkinson, *Gen. Supt*..E. Saginaw, Mich.
Saginaw Valley & St. Louis R. R. 4-8½ g. 39 m. 4 l. 64 c
T. M. Fish, *Gen. Supt*...... ....Ionia, Mich.
N. W. Merrill, *Div. Supt*........Saginaw, Mich.
Allan Bourn, *Pur. Agt*.. ... .Detroit, Mich.
Geo. C. Watrous, *M. M*.............Ionia, Mich
Salt Lake & Western R. R. (*See Un. Pac.; (6) Div.*)
San Francisco & No. Pac. 4-8½ g. 139 m. 11 lo. 245 c.
Arthur Hughes, *Gen. Man*..San Francisco, Cal.
H. C. Whiting, *Supt*....... ...San Rafael, Cal.
Ed. Reynolds, *Gen. M. M*.........Donahue, Cal.
Ed. Reynolds, *M. C. B*......... Donahue, Cal.
Sanborn, Cooperstown & Turtle M. R. R. In progress.
C. A. Roberts, *Gen. Man*. .. . Sanborn, Dak.
Sandy River R. R. 2 g. 18 m. 3 lo. 36 cars.
N. B. Beal, *Pres. & Supt* ....Phillips, Me.
M. Saunders, *M. M. & C. B*...... ..Phillips, Me.
Sandusky, Mansfield & Newark R. R. (*See B. & O.*)
Sanford & Indian River R. R. (*See So. Flor.*)
San Luis Obispo & Santa Maria R. R.
3 g. 20 m. 2 lo. 30 cars.
Charles Goodall, *Man*......San Francisco, Cal.
San Pete Valley R. R. 3 g. 33 m. 2 lo. 57 cars.
S. Bamberger, *Man*..... Salt Lake City, U. T.
J. E. Bamberger, *Pur. Agt*.... Salt Lake, U. T.
B. Bates, *M. M*...................... Morvin, U. T.
Saratoga, Mt. McGregor & Lake George R. R.
3 g. 11 m. 3 lo. 12 cars.
John McGee, *Supt.* ....Saratoga Springs, N. Y.
Savannah, Florida & W'n Ry. 5 g. 519 m. 62 lo. 1,063 c.
H. S. Haines, *Gen. Man*........Savannah, Ga.
R. G. Fleming, *Supt*... ....Savannah, Ga.
A. A. Aveilhé, *Pur. Agt*.........Savannah, Ga
G. M. D. Riley, *M. of Mach*......Savannah, Ga.
E. Geffcken, *For. Car Dept*.....Savannah, Ga.
Sav., Griffin & No. Ala. R. R. *Op. by Central (Ga.)*.
Schuylkill & Lehigh R. R. (*See Phil. & Read.*)
Schoharie Valley R. R. (*See Middleburg & Sch.*)
Scioto Valley R. R. 4-8¾ g. 132 m. 19 lo. 548 cars
Geo. Skinner, *Supt. & P. Agt*.....Columbus, O.
R. Bromley, *M. M*. ....Portsmouth, O
Seaboard & Roanoke R. R. 4-8½ g. 80 m. 21 lo. 384 c.
L. T. Myers, *Supt*..............Portsmouth, Va.
J. A. Walton, *Pur. Agt*........Portsmouth, Va.
M. M. Pendleton, *S. M. P. & M.* Portsmouth, Va.
Sedalia, Warsaw & Southern Ry. (*See Mo. Pac.*)
Sharpsville R. R. 4-8½ g. 23 m. 3 lo. 13 cars.
Thos. M. King, *V. P. & Gen. Man.* Pittsburgh, Pa.
W. C. Agnew, *Asst. Gen. Man*..Youngstown, O.
Shelby Iron Co. R. R. { 5-9 g. 7 m. 2 lo. / 3-6 g. 12 m. 3 lo. } 50 c.
J. A. McArthur, *G. Man*..Shelby Ir. Wks, Ala.
R. H. Stoughton, *Supt*..Shelby Iron Wks., Ala.
J. H. Burgbardt, *M. M*..Shelby Iron Wks, Ala.
Shell Beach R. R. 5 g. 22 m.
M. R. Spelman, *Supt* ....New Orleans, La.
Shenandoah Valley R. R. 4-9 g. 249 m. 32 lo. 849 c.
D. W. Flickwir, *Gen. Supt* ....Roanoke, Va.
W. C. De Armond, *Pur. Agt*. ..Philadelphia, Pa.
Supt. of M. P...Roanoke, Va.
W. A. Morgan, *M. C. B*.........Lynchburg, Va.
J. T. Robinett, *M. M*... . .. Petersburg, Va.
Shenango & Allegheny R. R 4-8½ g. 74 m. 8 lo. 248 c.
J. T. Blair, *G. Man. & Pur. Agt.* Greenville, Pa.
Edw. Richardson, *M. M. & C. B.* Greenville, Pa.
Shepaug R. R. 4-8½ g. 38 m. 3 lo. 28 cars.
Edwin McNeill, *Supt*.............Litchfield, Ct.
A. J. Broughet, *M. M*.......... Litchfield, Ct.
Ship Is., Ripley & Ky. R. R. 3 g. 25 m. 2 lo. 23 cars.
C. L. Harris, *Supt. & Pur. Agt*....Ripley, Miss
W. H. Phelps, *M. M*.................Ripley, Miss.
Silver City, Deming & Pacific R. R. 3 g. 47 m. 3 l. 141 c.
John W. Smith, *Gen. Supt*....Silver City, N. M.
Silver Lake Ry 4-8½ g. 6 m. 1 lo. 4 cars
C. W. S. Nobles, *Supt*.......... ..Perry, N. Y
Sinaloa & Durango R. R. 4-8½ g. 39 m. 2 lo. 40 cars.
Geo. S. Skilton, *Gen. S.* Culiacan, Sinaloa, Mex.
John E. Bell, *M. M*...............Culiacan, Mex.
Skaneateles R. R. 4-8½ g. 5 m. 2 lo. 5 cars.
J. McNamara, *Supt*.........Skaneateles, N. Y.
Sioux City & Pacific R. R. 4-8½ g. 427 m. 31 lo. 893 c.
W. P. Linsley, *Gen. Man*.... Missouri Valley, Ia.
C. M. Lawler, *Gen. Supt*....Missouri Valley, Ia.
R. W. Hamer, *Pur. Agt*.. ....Chicago, Ill.
W. G. Brownson, *Asst. Supt*.... .Norfolk, Neb.
S. A. Teal, *M. M*...............Missouri Valley, Ia.
W. H. Ramseyer, *M. C. B*. ..Missouri Valley, Ia.
Smyrna & Delaware Bay R. R. (*See Kent County.*
Sodus Bay Ry. (*See Northern Central.*
Somerset R. R. 4-8½ g. 25 m. 3 lo. 24 cars.
W. M. Ayer, *Supt & Pur. Agt*......Oakland, Me.
S. P. Mosher, *For. Car Rep*.... .Oakland, Me.
C. Crowell, *For. Lo. Rep's* ....No. Anson, Me.
Sonora Ry. (*See A., T. & S. Fe.*)
Sonoma Valley:
Arthur Hughes, *Gen. Man.* San Francisco, Cal.
H. C. Whiting, *Supt*...... .....San Rafael, Cal.
J. T. Peters, *Asst. Supt*.. ......Glen Ellen, Cal.
Ed Reynolds, *M. M*.. .... Donahue, Cal
South & North Alabama R. R. (*See Louis. & Nash.*)
South Carolina Ry. 5 g. 246 m. 46 lo. 834 cars.
John B. Peck, *Gen. Man*. ......Charleston, S. C.
S. B. Pickens, *Pur. Agt*........Charleston, S. C.
P. J. Cochrane, *Mast. of Mach.* Charleston, S. C.
Geo. H. Gramling, *M. C. B*....Charleston, S. C
South-Eastern Ry. 4-8½ g. 280 m. 30 lo. 1,000 cars.
T. A. McKinnon, *Gen. Man*.....Montreal, Can.
Robt. McLoud, *M. M*...........Farnham, P. Q.
South Florida R. R. 3 gauge 115 m. 13 lo. 250 cars.
B. R. Swoope, *Supt. & P. A*.......Sanford, Fla.
R. Derby, *M. M*.......... ......Sanford, Fla.
A. D. Stentiford, *M. C. B*.........Sanford, Fla.
South Mountain R. R. 4-8½ g. 18 m. 4 lo. 22 c.
W. H. Woodward, *Supt.* Pine G've Furnace, Pa.
South Pacific Coast R. R. 3 g. 81 m. 16 lo. 500 cars.
L. Fillmore, *Gen Supt*. ....San Francisco, Cal
W. H. Masterman, *M. M. & C. B*..Newark, Cal,

South-Western R. R. (Ga.) (See Central of Ga.)
South-Western Ry. (Ky.) 4-8½ g. 5 m. 1 lo. 28 cars.
M. Tabler, Supt. & Man......Harrodsburg, Ky.
J. C. Hool, Pur. Agt........Harrodsburg, Ky.
Southern Central R. R. 4-8½ g. 156 m. 21 lo. 467 c.
H. D. Titus, Gen. Supt. & P.A.....Auburn, N.Y
John White, M. M..............Auburn, N. Y.
H. Mooney, M. C. B..............Auburn, N. Y.
Southern Kansas Ry. (See At., Top. & Santa Fe.)
Southern Maryland R. R. 4-8½ g. 20 m. 1 lo. 20 c.
J. B. Ridgway, Supt..........Brandywine, Md.
C. R. Joyce, M. M............Brandywine, Md
Southern Pacific R. R. 4-8½ g. 203 m. 335 lo. 780 c
Northern Div. (For other Divs. see Cen. Pac.)
A. C. Bassett, Supt.......San Francisco, Cal.
J. R. Watson, Pur. Agt.....Sacramento, Cal.
J. T. Wilson, M. M.......San Francisco, Cal.
F. N. Bellisle, M. C. B....San Francisco, Cal.
Southern Pacific R. R. of Arizona. (See Cen. Pac.)
Southern Pacific R. R. of New Mexico. (See Cen. Pac.)
Spartanburg, Union & Columbia R. R.
(See Rich. & Dan.; (3) Div.)
Spring Brook R. R. 4-3 g. 8 m. 1 lo. 18 cars.
Charles Pugh, Pres...............Pittston, Pa.
Spring Hill & Parrsboro Ry. (See Cumberland.)
Springfield, Effingham & So.-E'n Ry. (See Ind. & Ill.)
Springville & Sardinia Ry. 4-8½ g. 12 m. 1 lo. 8 c.
Bertrand Chaffee, Pres.......Springville, N. Y.
St. Croix & Penobscot R. R. 4-8½ g. 22 m. 4 lo. 195 c.
S. W. Haycock, Supt. & Pur. Agt. .Calais, Me.
G. H. Corsen, M. M...............Milltown, Me
H. C. Tincker, M. C. B..........Milltown, Me.
St. Helen, Houghton Lake & West.R.R.4-8½ g. 13 m.
Z. C. Jessop, Gen. Man...........Detroit, Mich
St. John & Maine Ry. (See New Brunswick.)
St. John's Ry. 4-8½ g. 14½ m. 2 lo. 24 cars.
R. McLaughlin, Pr. & Supt. .Jacksonville, Fla.
J. M. Owens, M. of Mach....St. Augustine, Fla.
St. John's & Lake Eustis Ry. (See Florida Southern.)
St.Johnsb'ry&Lake Champ.4-8½ g.120 m 15 lo.372 c.
A. B. Jewett, Supt. & P. A. .St. Johnsbury, Vt
Geo. E. Howe, M. M. & C. B.St. Johnsbury, Vt
St. Joseph Valley R. R. 3 g. 15 m. 1 lo. 11 cars
B. Helmick, Gen. Man.......Buchanan, Mich.
St. Joseph & Des Loge Ry. 3 g. 13 m. 4 lo. 70 cars.
T. T. Onderdonk, Supt......Bonne Terre, Mo
E. B. Keyes, M. C. B.........Bonne Terre, Mo
St. Joseph & Western R. R.
4-8½ g. 252m. 21 lo. 175 cars.
D. McCool, Gen. Man..........St. Joseph, Mo.
E. Sleepy, M. M. & C. B....St. Joseph, Mo.
St. Joseph & Des Moines R. R. (See K. C., St. J. & C. B.)
St. Lawrence & Ottawa Ry. (See Can. Pac.)
St. Louis, Alton & Terre Haute R. R.
Main Line. (See C., C., C. & I.; Ind. & St. L. Div.
St. Louis & Cairo Div.: 4-8½ g 137 m. 19 lo. 800 c
G. W. Parker, Gen. Man....E. St. Louis, Ill.
J. L. Hinckley, Supt.........Belleville, Ill.
P. H. Murphy, M. M.........E. St. Louis, Ill.
St. Louis Bridge Co. and Tunnel R. R.
4-8½ g. 31 m. 22 lo. 11 cars.
Wm. Taussig, Gen. Man..........St. Louis, Mo
A. W. Dickinson, Supt...........St. Louis, Mo.
J. E. Williams, Jr., Pur. Agt....St. Louis, Mo
Geo. W. Walshe, M. M............St. Louis, Mo.
St. Louis, C. Cœur & St. Ch. Ry. 3 g. 16 m.
F. M. Colburn, Gen. Man.........St. Louis, Mo.
St. Louis Coal R. R. 4-8½ g. 93 m. 10 lo. 217 cars.
Robt. Meek, Supt...............Carbondale, Ill.
Jas. C. Bryden, Pur. Agt........St. Louis, Mo.
St. Louis, Des Moines & Northern Ry. 4-8½ g. 43 m.
C. F. Merk, Supt..............Des Moines, Ia.
St. L., Ft.Scott & Wichita R.R. 4-8½ g.214 m.6 l.337 c.
J. W. Miller, V.P.& Gen. Man..Fort Scott, Kan.
Tho. N. Lewis, Asst. Supt......Fort Scott, Kan.
Henry Berger, M. M.............Ft. Scott, Kan.
St. L., Hannibal & Keokuk. 4-8½ g. 85 m. 5 lo. 70 c.
E. C. Case, Rec. & Man........ Hannibal, Mo.
E. W. Hoisington, M. M.........Hannibal, Mo.
St. Louis, Iron Mt. & So'n Ry. (See Mo. Pac.; (4) Div.)
St. L., Keokuk & No.-W'n. Ry. (See C., B. & Q.)
St. L., Salem & Little Rock. 4-9 g. 72 m. 5 lo. 111 c.
H. A. Crawford, V. Pr. & P. A...St. Louis, Mo.
E. B. Sankey, Supt..................Salem, Mo.
Thomas Everson, M. M.............Steelville, Mo
J. W. Houston, M. C. B...........Steelville, Mo.
St. Louis & Cairo R. R. 3 g. 152 m. 22 lo. 896 cars.
Chas. Hamilton, Gen. Supt......St. Louis, Mo.
E. J. Newell, M. M...............E. St. Louis, Mo.
St. L. & San Fran. Ry. 4-8½ g. 943 m. 103 lo. 3,737 c.
C. W. Rogers, V. P. & Gen. Man..St. Louis, Mo.
D. H. Nichols, Supt. Tran..No. Springfield, Mo.
A. P. Mann, Jr., Pur. Agt........St. Louis, Mo.
M. Kearney, M. M. & C. B..No. Springfield, Mo.
East Div.: A. Veech, Supt..........St. Louis, Mo.
Central Div.: W.A.Thoms, Supt..Springfield, Mo.
Kan. Div.: J. R. Wentworth, Supt.Neodesha, Kan.
St. Martin's & Upham Ry. 4-8½ g. 30 m. 2 lo. 8 cars.
A. E. Killam, Manager.........St. Martin's, N. B.
St. Paul Eastern Grand Trunk Ry. 4-8½ g. 15 m.
D. C. Lamb, Gen. Supt...........Oconto, Wis.
St. Paul, Minneapolis & Manitoba Ry.
4-8½ g. 1,402 m. 201 lo. 5,068 cars.
A. Manvel, Gen. Man.............St. Paul, Minn.
H. C. Ives, Asst. Gen. Man.....St. Paul, Minn.
E. B. Wakeman, Asst.Gen.Supt.St. Paul, Minn.
J. C. Morrison, Pur. Agt.........St. Paul, Minn.
Thos. Downing, M. M. & C. B..St. Paul, Minn.
Breck. Div.: W. S. Kemp, Supt...St. Paul, Minn.
F. F. Div.: J. B. Rice, Supt........St. Paul, Minn.
No'n Div.: A. Guthrie, Supt.....Crookston, Minn.
St. Paul & Duluth R. R. 4-8½ g. 225 m. 37 lo. 1,080 c.
W. H. Fisher, Gen. Supt.........St. Paul, Minn.
J. G. Callahan, Pur. Agt.........St. Paul, Minn.
Chas. F. Ward, M. M. & M. C. B..St. Paul, Minn.
State Line & Sullivan R. R. 8½ g. 25 m. 3 lo. 263 c.
I. O. Blight, Supt..................Towanda, Pa.
Staten Island R. R. ½ g. 13 m. 4 lo. 18 c
J. W. Wilbur, Supt..............New York, N. Y.
Stony Clove & Catskill Mountain R. R.
3 g. 14 m. 2 lo. 22 cars.
Geo. Coykendall, Gen. Supt....Rondout, N. Y.
Stony Creek R. R. 4-8½ g. 103 m.
Geo. B. Boggs, Supt .... Norristown, Pa.
Sterling Mountain Ry. 6 g. 8 m. 2 lo. 145 cars.
J. C. Missimer, Supt...........Sloatsburg, N. Y.
Suffolk Lumber R. R. 3 g. 15 m. 3 lo. 41 cars.
W. M. Whaley, Supt.,..............Suffolk, Va.
Summit Branch R. R. 4-9 g. 20 m. 7 lo. 10 cars.
Thomas Gucker, Supt........Williamsport, Pa.
Susquehanna & Delaware River R. R. In progress.
D. Y. Kilgore, Pres.............Philadelphia, Pa.
Sussex R. R. (See Del., Lack. & West.)
Syracuse, Binghamton & N. Y. R. R. (See D. L. & W.)
Syr., Ontario & N. Y. R. R.
Albert Allen, Supt..............New York, N. Y.
Syracuse, Geneva & Corning
(See Fall Brook Coal Co.)

T

Tennessee Coal R. R. 5 g. 28 m. 8 lo. 204 cars.
A. M. Shook, Gen. Man......Tracy City, Tenn.
W. A. Knight, M. M........... Tracy City, Tenn.
Tennessee & Sequatchee Valley R. R.
3 g. 42 m. 1 lo. 24 cars.
Chas. Clinton, Gen. Supt....Spring City, Tenn.
P. V. Mooney, Pur. Agt......Spring City, Tenn.
Terre Haute & Indianapolis R. R.
4-9 g. 421 m. 105 lo. 4,318 cars.
Joseph Hill, Gen. Supt...........St. Louis, Mo.
C. R. Peddle, P. Agt........Terre Haute, Ind.
Geo. H. Prescott, S. M. P. & M. Terre Haute, Ind.
F. C. Cleaver, M. M..........Terre Haute, Ind
E. D. Carter, M. C. B ....Terre Haute, Ind.
Chas. Butler, M. M..................Effingham, Ill.
Clinton Idler, Foreman ... Indianapolis, Ind.)
Terre Haute & So.-Eastern Ry. 4-9 g. 44 m. 2 lo. 145 c.
Geo. Atherton, Supt.......... Terre Haute, Ind.
Texas-Mexican Ry. (See Mex. Nat.)
Texas Trunk R. R. 4-8½ g. 36 m. 2 lo. 8 cars)
Hugh Irwin, Gen. Supt..............Dallas, Tex.
Texas Western Ry. 3 g. 52 m. 2 lo. 44 cars.
Henry Hatch, Gen. Man..........Houston, Tex.
T. F. Gilspin, M. M.................Houston, Tex.
Texas & N.O.R. R. (See Cen. Pac.; G. H. & S. A. Div..
Texas & Pacific. (See Mo. Pac. Ry.; (6) Div
Texas & St. Louis Ry. 3 g. 769 m. 84 lo. 2,000 cars.
S. W. Fordyce, Rec. and Gen. Man. St. Louis, Mo.

C. S. Brooke, Pur. Agt.............St. Louis, Mo.
M. C. B..........Pine Bluff, Ark.
Mo. & Ark. Div.:
W. H. Adams, Supt.........Pine Bluff, Ark.
Rich. Williams, M. M.......Pine Bluff, Ark.
Tex. Div.: H. Flanders, Supt...........Tyler, Tex.
J. A. Hanglin, Gen. M. M...........Tyler, Ark.
Tionesta Valley R. R. 3 g. 15 m.
George Dickinson, Gen. Supt.....Sheffield, Pa.
Tioga R. R. 4-8½ and 6 g. 67 m. 18 lo. 960 cars
L. H. Shattuck, Supt.............Blossburg, Pa.
J. C. Guthrie, Pur. Agt......New York, N. Y.
Pere Bonny, M. M..................Blossburg, Pa.
D. H. Stratton, M. C. B.........Blossburg, Pa.
Toledo, Ann Ar. & No. Mi h. Ry.
4-8½ g. 63 m. 9 lo. 186 c.
J. M. Ashley, Gen. Man......Ann Arbor, Mich.
H. W. Ashley, Supt. & Pur. Agt. do
C. C. Dodge, M. M..............Ann Arbor, Mich.
Toledo, Cin. & St. Louis R.R. 3 g. 798 m. 101 lo. 3,500 c.
W. H. Pettibone, Gen. Supt.........Toledo, O.
F. W. Stewart, P. Agt..................Toledo, O.
Thos. Robertson, M. M..............Delphos, O.
Toledo Div.: W. H. Vandergrift, Supt.; do
J. S. Wiers, For. Car Rep.........Delphos, O.
St. Louis Div.: Frank F. Allen....Charleston, Ill.
P. H. Murphy, M. M..............Charleston, Ill.
Toledo, Peoria & Western R. R. 4-8½ g. 223 m.
E. N. Armstrong, Supt...............Peoria, Ill.
Toledo & Indianapolis R. R. 4-8½ g. 43 m. 4 lo. 118 c.
David Robison, Jr., Rec...............Toledo, O.
Toledo & Ohio Central R. R.
4-8½ g. 325 m. 46 lo. 4,760 cars.
T. M. Peelar, Supt..................Bucyrus, O
F. W. Stewart, Pur. Agt.............Toledo, O.
J. B. Morgan, M. M..................Bucyrus, O.
Tonawanda Val. & Cuba R. R. (See Brad., B. & K.)
Toronto, Grey & Bruce Ry. (See Canadian Pacific.)
Toronto & Nipissing Ry. (See Mid. Ry. of Can.)
Troy & Boston R. R. 4-8½ g. 48 m. 20 lo. 484 cars.
D. Robinson, Pres.....................Troy, N. Y.
Joseph Crandell, Supt...............Troy, N. Y.
C. H. Hubbell, Pur. Agt.............Troy, N. Y.
Z. B. Davis, M. M.....................Troy, N. Y.
A. Brewer, M. C. B....................Troy, N. Y.
Troy & Greenfield R. R. & H. Tunnel. 4-8½ g. 44 m.
A. W. Locke, Man..........North Adams, Mass.
Tuckerton R. R. 4-9 g. 31 m. 2 lo. 29 cars
J. J. Pharo, Supt. & Pur. Agt. Tuckerton, N. J.

U

Ulster & Delaware R. R. 4-8½ g. 74 m. 10 lo. 218 cars.
Jas. H. Jones, Supt..............Rondout, N. Y.
John H. Decker, M. C. B........Rondout, N. Y.
Union Ry. 5 g. 9 m. 3 lo.
C. E. James, Pres.............Chattanooga, Tenn.
D. J. O'Connell, Gen. Man. Chattanooga, Tenn.
Union Pacific Ry. (7 Gen. Divs.)
3 & 4-8½ g. 4,633 m. 510 lo. 10,550 cars.
S. R. Callaway, Gen. Man..........Omaha, Neb.
S. T. Smith, Gen. Supt..............Omaha, Neb.
Thos. L. Kimball, Asst. Gen. Man. Omaha, Neb.
Pur. Agt..................Omaha, Neb.
I. H. Congdon, S. M. P. & C. D...Omaha, Neb.
John Wilson, Asst. do..............Omaha, Neb.
(1) Neb. Div.: O.H. Dorrance, Gen.Supt. Omaha, Neb.
E. Div.: C. B. Havens, Supt.........Omaha, Neb.
J. H. McConnell, M. M......North Platte, Neb.
A. M. Collett, M. C. B..............Omaha, Neb.
L. Pole Div.: W. A. Deuel, Supt...Cheyenne, W.T.
J. H. McConnell, M. M...........N. Platte, Neb.
(2) Wy. Div.: E. Dickenson, Gen.Supt. .Laramie, W. T.
T. A. Davis, M. M...................Laramie, W. T.
Wes. Div.: C. E. Wurtelle, Supt. Evanston, W. T.
Geo. F. Chapman, M. M.......Evanston, W. T.
(3) Idaho Div.: R. Blickenderfer, Gen. Supt. Ogden, U.
John S. Hickey, M. M..........Shoshone, Id.
Ogden Short Line Div.:
R. Blickensderfer, Supt......... Pocatello, Id.
Utah & Northern Div.:
J. S. Hickey, M. M..........Eagle Rock, Id.
J. W. Paul, Gen. For. C. D...Eagle Rock, Id.
(4) Col.Cent. Div.: A.A.Egbert, Gen.Supt. Denver, Col.
F. Meirtsheimer, M. M............Denver, Col.
C. C. Div.: P. Touhy, Supt...........Denver, Col.
So. Park Div.: J. T. Choate, A. Supt...Como, Col.
(5) Kan. Div.: H.O. Brinkerhoff, G. Supt. Kan. City, Mo.
K. Pac. Div.: J. O. Brinkerhoff, Supt. Kan. C'y, Mo.
J. O. Chapman, M. M...........Armstrong, Kan.
T. B. Roberts, M. C. B.......Armstrong, Kan.
Kansas Central Div.:
J. O. Brinkerhoff, Supt...Leavenworth, Kan.
Smoky Hill Div.:
O. H. Dorance, Supt.............Wallace, Kan.
J. B. Dailey, M. M.....................Ellis, Kan.
(6) Salt Lake & Western Div.:
W. W. Ritter, Supt.......Salt Lake City, Utah.
United States Rolling Stock Co. 19 lo. 4,692 cars.
A. Hegewisch, Pres............New York, N. Y.
W. H. Chaddock, Gen. Agt........Chicago, Ill.
Utah Central Ry. 4-8½ g. 280 m. 21 lo. 358 cars.
John Sharp, Gen. Supt...Salt Lake City, Utah.
S. H. Hill, Pur. Agt.... Salt Lake City, Utah.
Geo. G. Bywater, M. M..Salt Lake City, Utah
Peter Reid, M. C. B.......Salt Lake City, Utah.
Utah & Nevada Ry. 3 g. 37 m. 3 lo. 33 cars
W. W. Ritter, Gen. Man...Salt Lake City, Utah.
Robert Anderson, M. M...Salt Lake City, Utah.
Utah & Northern Ry. (See Union Pac.; (3) Div.)
Utah & Pleasant Valley Ry. (See Den. & Rio. Gr.)
Utica, & Black Riv. R. R. 4-8½ g. 180 m. 25 lo. 412 c.
E. A. Van Horne, Gen. Supt. & P.A..Utica, N.Y.
H. W. Hammond, Asst. Supt.......Utica, N. Y.
John Bailey, M. M....................Utica, N. Y.
David James, M. C. B.................Utica, N. Y.

V

Vaca Vall. & Clear Lake R. R. 4-8½ g. 30 m. 2 lo. 19 c.
G. B. Stevenson, Gen. Supt.......Vacaville, Cal.
Valley Ry. (Ohio) 4-8½ g. 75 m. 20 lo. 889 cars.
Isaac Reynolds, Gen. Man.........Cleveland, O.
H. Melcher, Pur. Agt..............Cleveland, O.
C. T. Johns, M. M.................Cleveland, O.
Valley R. R. Va. 4-8½ g. 62 m
S. Spencer, Pres...................Baltimore, Md.
Vicksburg & Brunswick R. R. (See Cen. of Ga.)
Vicksburg & Meridian R.R. (See Cin., N.O. & Tex. Pac.)
Vicks. Shreveport & Pac. R. R. (See C., N. O. & T. P.)
Victoria Ry. (See Midland Ry. of Can.)
Virginia Midland Ry. (See Rich. & Dan.; (4) Div.)
Virginia & Truckee R. R. 4-8½ g. 52 m. 14 lo. 322 c.
Carson & Colorado R. R. 3 g. 294 m. 8 lo. 228 c.
H. M. Yerington, Gen. Supt...... Carson, Nev.
R. J. Laws, A. Supt. (C. & Col.) Hawthorne, Nev.
Hume Yerington, Pur. Agt.........Carson, Nev.
I. N. Fording, M. M..................Carson, Nev.
M. M. Hyde, M. C. B.................Carson, Nev.

W

Wabash, Chester & W'n R. R. (See St. Louis Coal.)
Wabash, St. Louis & Pacific Ry. (4 Gen. Divs.)
4-8½ g. 3,241 m. 598 lo. 17,230 cars.
Jas. F. Joy, Pres......................St. Louis, Mo.
A. L. Hopkins, V. P..................St. Louis, Mo.
A. A. Talmage, Gen. Man........St. Louis, Mo.
H. H. Wellman, Pur. Agt..........St. Louis, Mo.
J. B. Barnes, Supt. M. P. & M. Springfield, Ill.
M. M. Martin, Supt. Car Dept........Decatur, Ill.
(1) Eas'n Div.: G. W. Stevens, Supt..........Peru, Ind.
W. S. Morris, M. M..............Fort Wayne, Ind.
A. W. Quackenbush, Asst. M. M.. Peru, Ind.
Thos. Anderson, M. C. B................Peru, Ind.
(2) Middle Div.: C. F. Lape, Supt.... Springfield, Ill.
Henry Seips, M. M...............Springfield, Ill.
B. B. Rose, M. C. B......................Decatur, Ill.
G. A. Hurd, Asst. Supt...............Decatur, Ill.
E. B. Hyde, Asst. Supt...............Havana, Ill.
(3) Western Div.: R. G. Butler, Supt....Moberly, Mo
J. K. Lape, M. M......................Moberly, Mo.
John Lang, M. C. B...................Moberly, Mo.
D. Moin. Div.: C. F. Meek, A. Supt. Des Moines, Ia
Walden's Bridge R. R. 3 g. 23 m. 3 lo. 37 cars.
John G. Scott, Gen Man....Jenks P. O., Tenn.
Wallkill Valley
J. E. Childs, Gen. Supt........New York, N. Y.
Geo. H. Graves, Supt............Kingston, N. Y.
E. Minshull, M. M...............Middletown, N. Y.
I. W. Fowler, Pur. Agt.........Middletown, N. Y.

Walla Walla & Columbia Riv. R. R. (See Ore. Ry.)
Walton R. R. 5 g. 10 m. 1 lo. 7 cars.
D. H. Walker, Pres.................Monroe, Ga.
Warren & Farnsworth Valley R. R.
3 g. 16 m. 3 lo. 39 cars.
A. D. Wood, Gen. Man..............Warren, Pa
Warwick Valley R. R. (See Leh. & Hud. River.)
Washington, Ohio & West. R. R. 4-8½ g. 52 m. 5 lo. 87 c.
S. M. Brophy, Supt................Alexandria, Va
W. Mountjoy, Act. For..........Alexandria, Va.
John Harrison, M. C. B........Alexandria, Va.
Waynesburg & Washington Rd. 3 g. 29 m. 3 lo. 26 c.
C. E. Bower, Supt..................Waynesburg, Pa.
A. M. Kline, M. C. B.............Waynesburg, Pa.
Welland Ry. 4-8½ g. 25 m. 4 lo. 147 cars.
William Pay, Supt.........St. Catharines, Ont.
Jas. Taylor, M. M.........St. Catharines, Ont.
Wm. H. Pay, M. C. B.......St. Catharines, Ont.
West Feliciana R. R. 4-8½ g. 27 m. 2 lo. 22 cars.
J. B. McGehee, Pr. & Gen. Supt. Bayou Sara, La.
J. A. Tilton, M. M. & C. B......Bayou Sara, La.
W. Va., Central & Pittsb'g Ry. 4-8½ g. 50 m. 4 lo. 119 c.
T. B. Davis, Gen. Man........Piedmont, W. Va.
W. E. Porter, Gen. Supt......Piedmont, W. Va.
Geo. W. Harrison, Pur. Agt...Piedmont, W. Va
E. W. Lippencott, M. M.....Piedmont, W. Va.
West & East R. R. (See Ill. Cen.; N. O. Div.)
West Jersey R. R. (See Penn. R. R.; (3) Div.)
Western R. R. (of Ala.) 5 g. 85 m. 15 lo. 270 cars.
Atlanta & W. Point Rd. 5 g. 87 m. 14 lo. 240 c.
Cecil Gabbett, Gen. Man. & Supt...Mont., Ala.
C. D. Wall, M. M. & C. B ...Montgomery, Ala.
Western Counties' Ry. 4-8½ g. 67 m. 8 lo. 137 cars.
J. Brignell, Supt..................Yarmouth, N. S.
Western Maryland R. R. 4-8½ g. 127 m. 28 lo. 610 c.
J. M. Hood, Pr. & Gen. Man....Baltimore, Md.
R. J. Adair, Pur. Agt............Baltimore, Md.
David Holtz, Mast. of Mach..Union Bridge, Md.
J. H. Nussear, M. C. B.......Union Bridge, Md.
Western No. Carolina R. R. 5 g. 210 m. 17 lo. 160 c.
V. E. McBee, Supt..............Salisbury, N. C.
Jos. P. Minetree, Pur. Agt........Richmond, Va.
G. W. Gates, M. M.............Salisbury, N. C.
Western & Atlantic R. R. 5 g. 138 m. 58 lo. 952 c.
R. A. Anderson, Gen. Supt.........Atlanta, Ga.
A. B. Bostwick, Asst. Supt..... Atlanta, Ga.
Lamar Collier, M. M...............Atlanta, Ga
Wm. Kinyon, M. C. B...............Atlanta, Ga,
Wheeling, Pittsburg & Baltimore R. R. (See B. & O.)
Wheeling & Lake Erie R. R. 267 m. 37 lo. 1,922c.
M. D. Woodford, Rec. & Gen. Man..Toledo, O.
O. P. Dunbar, Gen. M. M............Norwalk, O.
John Hillhouse, Div. M. M.........Norwalk, O.
Cleve. & Mar. Div.: P. Pease, Rec. & Gen. Man.
A. Galloway, M. M. .... Cambridge, O.
Whitby, Port Perry & Lindsay Ry. (See Mid. of Can.)
White Water R. R. (See Ft. W., Cin. & Lou.)
Whitefield & Jefferson R. R. (See Bos., Con. & Mon.)
Whitneyville & Machiasport R. R. 8 m. 2 lo. 48 c.
C. Sullivan, G. M. & Pur. Agt. Whitneyville, Me.
Wicomico & Pocomoke R. R. 4-8½ g. 30 m. 2 lo. 38 c.
L. Showell, Pres......................Berlin, Md.
Williamsport & North Branch R. R.
4-8½ g. 14 m. 2 lo. 4 cars.
B. G. Welch, Man. & P. Agt...Hughesville, Pa.
Williamstown & Del. River R. R.
4-8½ g. 27 m. 1 lo. 12 cars.
Samuel Garwood, Supt ...Williamstown, N. J
Wilmington, Columbia & Augusta R. R. (See W. & W.)
Wilmington & No'n R. R. 4-8¾ g. 85 m. 17 lo. 155 c.
A. G. McCausland, Supt. & P. A. Wilmington, Del
George Rommel, M. M.........Wilmington, Del.
Alex. Maitland, M. C. B...... Wilmington, Del.
Wilmington & Weldon; Northeastern; S. C. Central;
Cheraw & Darlington; Cheraw & Salisbury; and
Wilmington, Columbia & Augusta R. Rs.
4-8½ g. 682 miles 104 locomotives 1,725 cars.
H. Walters, Gen. Man.......... Baltimore, Md.
J. F. Divine, Gen. Supt........Wilmington, N. C.
John Bisset, M. M.............Wilmington, N. C.
W. H. Day, M. C. B................Florence, S. C.
J. H. Davis, M.C.B. (W.& W.). Wilmington, N. C.
Winifrede R. R. 4-9 g. 5 m. 1 lo. 65 cars.
Theodore Wright, Pres.........Philadelphia, Pa.
Windsor & Annapolis Ry. 4-8½ g. 130 m. 10 lo. 160 c.
P. Innes, Gen. Man.................Kentville, N. S.
Wm. Yould, M. M...................Kentville, N. S.
Wm. Grierson, M. C. B...........Kentville, N. S.
Wisconsin Central R. R. 4-8½ g. 480 m. 49 lo. 1,800 c
F. N. Finney, Gen. Man..........Milwaukee, Wis.
E. K. Howes, Pur. Agt..........Milwaukee, Wis.
H. A. Barnes, M. M..............Stevens Pt., Wis.
Mil. East. Mid. So. & No. Divs.:
A. A. Allen, Supt...................Milwaukee, Wis.
Wis. & Minn. and Minn. St. C. & Wis. R.R.'s.:
G. T. Wiswell, Supt......Chippewa Falls, Wis.
Wisconsin, Iowa & Nebraska.
G. C. McMichael, Supt.......Marshalltown, Ia.
J. V. Johnston, Pur. Agt.....Marshalltown, Ia.
M. C. Wheeler, M. M.........Marshalltown, Ia.
Wisconsin & Michigan R. R. (See Mil. & North'n.)
Wisconsin & Minnesota R. R. (See Wis. Cen.)
Woodruff Sleeping & Parlor Coach Co.
Job H. Jackson, Pres..........Philadelphia, Pa.
Wm. G. Johnston, V-Pres....Philadelphia, Pa.
J. C. Paul, Gen. Man.........Philadelphia, Pa.
R. A. Rutherford, Supt.......Philadelphia, Pa.
Wood River Branch R. R. 4-8½ g. 6 m. 2 lo. 3 cars.
L. M. Barber, Supt..............Hope Valley, R. I.
Woodstock R. R. 4-8½ g. 14 m. 1 lo. 3 cars.
J. G. Porter, Supt...................Woodstock, Vt.
Worcester, Nashua & Rochester R.R.
4-8½ g. 95 m. 20 lo. 523 cars.
Chas. Howard, Gen. Man....Worcester, Mass.
G. W. Hurlburt, Supt.........Worcester, Mass.
A. R. Barrett, M. M. & C. B..Worcester, Mass
Worcester & Shrewsbury R. R. 3 g. 3 m. 3 lo. 9 c.
J. F. Bigelow, Supt.............Worcester, Mass.
G. E. Hapgood, Pur. Agt....Worcester, Mass.
Chas. Cleveland, M. M........Worcester, Mass.
Worcester & Somerset R. R. (See N.Y., Phil. & Nor.)

Y

York & Peach Bottom Ry. 3 g. 40 m. 5 lo. 100 c.
S. M. Manifold, Supt. & Pur. Agt.....York, Pa.
G. W. Hoover, M. M.......................York, Pa.